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INVENTORY OF TERRESTRIAL WILDLIFE SPECIES
FOR THE STALLION PLANNING UNIT

BASED ON METHODS FROM THE
INTEGRATED HABITAT AND CLASSIFICATION SYSTEM (IHICS)

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Bureau of Land Management
Socorro, New Mexico

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INTEGRATED HABITAT INVENTORY CLASSIFICATION SYSTEM (IHICS)
OR TERRESTRIAL AND AQUATIC WILDLIFE SPECIES
FOR THE STALLION PLANNING UNIT

Socorro District, BLM, New Mexico

INTRODUCTION

The Bureau of Land Management (BLM) of the Department of the Interior did an Integrated Habitat Inventory and Classification System (IHICS) study on the Stallion Planning Unit during fiscal year 1980 and part of 1981. Inventory procedures met the guidelines set forth in BLM Manual 6610-Habitat Inventory and Analysis. Specific objectives of the inventory were to:

1. Determine by density wildlife species occurrence throughout the study area.
2. Identify and prepare for permanent collections, representative small mammal specimens, as well as specimens of reptiles and amphibians.
3. Locate and map all transect sites and survey routes.
4. Map on mylar overlays raptor use areas, big game concentration areas, special habitat features, and special use areas.
5. Make a mylar overlay of standard habitat sites (SHSs), and habitat sites; determine acres of each.

This inventory is an add-on to the IHICS done for the Socorro District west side fiscal year 1979, by a private consultant group and all SHS are coded in association with that survey. For survey information, consult Ecological Research Associates (LGL) Final Report.

STUDY AREA

The study area lies primarily in the upper Sonoran life zone as described by Bailey (1931). Most of the Stallion Unit is in the basin and range physiographic province and is dominated by the Rio Grande Rift. The area is a mesa of Paleozoic Rock units partially overlain by recent sediment. The study area lies within the Stallion Planning Unit (Fig. 1).

Topography ranges from 4,550 ft. (1,387 m.) to 7,500 ft. (2,287 m.) on the east side of the Magdalenas. The Planning Unit lies within Socorro County and the vegetation consists of Southern Desertic Basins, Pecos-Canadian Plains and Valleys, and New Mexico and Arizona plateaus and mesas.

Great Basin Desert shrubs are composed of four-wing saltbush, sand sagebrush, rabbit brush, snakeweed, Rhus spp. and desert olive. Typical Chihuahuan Desert habitat is composed principally of creosote. Pinyon juniper stands are found throughout the study area in the higher elevations, and the best stands grow on the sandy, limestone hills, basalt hills, Malpais, and loamy range sites. Small scattered stands can be found on north-facing slopes above 6,000 ft. elevation.

METHODS AND MATERIALS

Habitat Type Verification

During the fall of 1979 vegetative mapping was conducted in the study area. Twelve habitat sites were identified by the two dominant vegetative

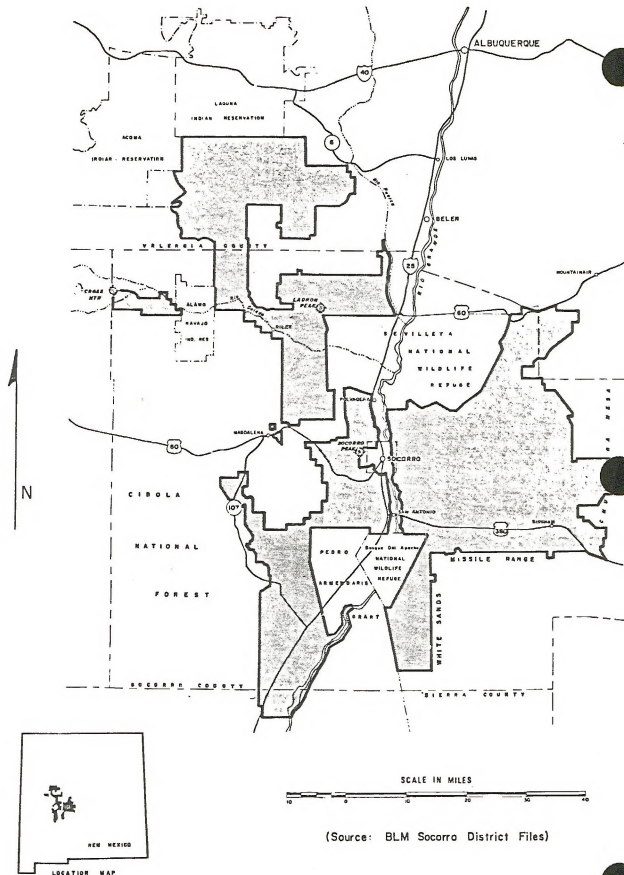


Figure 1. Map of the Study Area.

Table 1
STANDARD HABITAT SITES FOR THE
STALLION PLANNING UNIT, JORNADA RESOURCE AREA,
SOCORRO COUNTY, NEW MEXICO

SHS	Acres
Creosote Questa	46,874
Pseudoriparian	15,950
Malpais or Lava	25,574
Mixed Shrub Grass Hills	60,897
Mesquite Rolling Upland	22,491
Grass Pediment	185,931
Shrub Pediment	295,056
Creosote Hill	99,063
Mixed-Shrub Grass Valley	18,263
Riparian	4,000
Pinyon/Juniper Woodland	543,449
Mixed-Shrub Hogback	12,774

types and landform (Table 1 shows SHS and acres). Methods were based on the 6610 Manual for IHICS. All SHSs were delineated on mylar overlays for BLM color quads. Vegetation within each site was determined from aerial photos, range survey maps, soil survey maps, USGS topographic maps, and ground truthing.

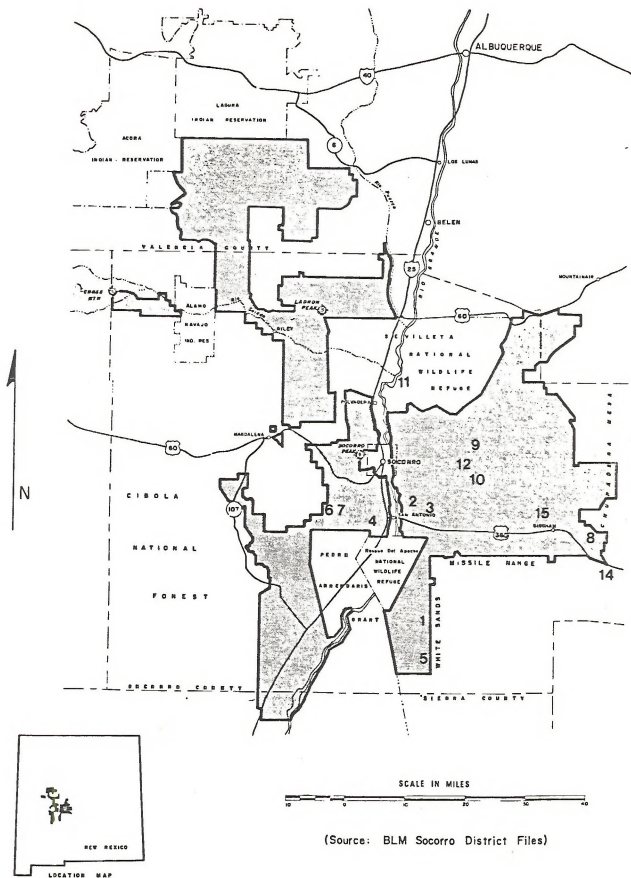
Transect Locations

Fourteen transects were established throughout the study area (Fig. 2). Eleven SHS's were sampled with three SHS's having more than one transect. Transects were located next to accessible roads and were set up to best represent the SHS. Transects were set up in the best homogeneous habitat possible and usually ran from east to west to best utilize morning sun rays for identifying birds. All transects are marked at their beginning with wooden fence posts and with the transect number and location on aluminum tags. All transects were 1,600m long and were as straight as possible by flagging and use of a compass.

Bird Survey

The Emlen variable strip census (Emlen 1971, 1977) was used to estimate bird densities. All Emlen transects were started 30 minutes after sunrise and were finished 2 to 2½ hours later.

Transect lengths were 1,600m long and strips 125m on either side of the transect were included in the census. Birds were observed by the use of Bushnell 7 x 21 power 40mm zoom binoculars and by sound which was



(Source: BLM Socorro District Files)

Figure 2. Transect Locations on Study Area.

based on expertise by field biologists. Identification of birds was based on the use of bird field guides (Peterson, 1961; Robbins et. al. 1966; Audubon Society 1979). Each bird on the transect was identified according to species and sex if possible. Estimates of distances from transect line to bird was done in meters and for the most part was done by one biologist to keep distances as standard as possible.

Each transect was run for three consecutive days during the summer and again during the winter. Data was recorded on forms from the 6610 Manual and later made into table form. Information recorded was relative abundance, coefficient of detectability, and density.

Opportunistic Bird Survey

All other new birds or significant birds seen outside the transect were recorded on 6610 forms for species occurrence. All raptor aeries were identified by species if possible and recorded as active or inactive, photographed and located. Raptor locations are identified on USGS 7.5 minute topo maps.

Mammal Survey

Mammals were trapped along the same transect as the birds. The Calhoun method (1951) was used for counting small rodents for three consecutive nights. Trapping was not conducted during the weeks when there was a waxing or waning full moon. Most of the time snap trapping was carried out consecutively with the bird transect. Snap trapped

mammals were collected while running the bird transect and later in the day the traps were reset and baited with rolled oats wetted by saliva. The trapping grid was 60m x 300m with forty trapping stations (15m apart) on two parallel lines (61m apart). Each station had two small victor snap traps and one victor rat trap.

Small mammal densities was calculated on the number of each species caught per 360 trap nights (3 nights x 120 traps per night). Small mammals were measured, weighed, sexed, made into study skins, and deposited in the museum of mammalogy, University of New Mexico or New Mexico State University. Small mammal identifications were verified and recorded by the staff at either school recorded in field notebooks, and catalogued in a notebook at the Socorro Office.

Opportunistic Mammal Survey

Bats were documented by mist netting for them at springs, streams and caves. All bat colonies encountered were identified to species, whether it was a nursery or not and located on USGS topographic maps. A maximum of five of each species caught at each location were made into voucher specimens and deposited at New Mexico State University. Seven areas were sampled for bats, four within the study area and three outside (Figure 3).

Large mammals and their sign were recorded wherever encountered. Skulls and bones of some species were collected, identified, and verified by the University of New Mexico. All large mammals of any significance were recorded on 6610 species occurrence forms and placed in a field notebook.

Reptile and Amphibian Survey

Materials and Methods

Diurnal reptiles (primarily lizards) were sampled by walking the transect lines in the morning during peak activity periods, usually between 0700 and 1200 hours depending on local weather conditions. A 5-meter steel tape was used to measure, to the nearest millimeter, perpendicular distances from the point where a lizard was first seen to the transect line. Densities are thus based on an effective area of $10\text{m} \times 1,600\text{m} = 16,000\text{m}^2$ covered. Density estimates are only given for lizards and are a function of the total number of animals seen, as will be discussed later. Nocturnal reptiles (snakes in this case) were sampled by driving at night along three paved roads in the Resource Area: U.S. Highway 380 between San Antonio and Bingham, New Mexico State Highway 1 south of San Antonio, and U.S. Highway 60 west of Socorro. Sampling was done during waning periods of the moon as high moonlight levels inhibit nocturnal animal activity in general; nocturnal sampling was not done during the week preceding the full moon. A "density estimate" of nocturnal snakes is given only for the San Antonio-Bingham route, and will be discussed later. Anuran amphibian species occurrences were noted during night driving, but no attempt to systematically census amphibians of any kind was made during this study. Several species of amphibians were encountered during bat-netting activities. Voucher specimens of virtually every species encountered on each transect as well as during night-driving were collected, prepared and preserved by standard methods and are deposited in the amphibian and reptile collection of the Biology Department of New Mexico State University.

Fish Survey

Due to lack of time and suitable habitat no survey was conducted on fish. The only source of fish in the survey area was the Rio Grande and enough information has been gathered on fish of the Rio Grande to not warrant a survey during this inventory.

Special Habitat Features

Special habitat features were located and drawn on 7.5 topo maps. These features are based on identified special habitat features in the 6610 Manual Illustration 2, page 2 (.35), pertinent to the Socorro District. A list of Special Habitat features and their codes identified by the Socorro District can be found on page 33.

Vegetative Transects

Fifteen vegetative transects were run along the same transects used for the bird and mammal inventory.

Plot sampling was used based on a modified version of Daubenmire (1955). One hundred points were picked along the transect 10 meters apart. Information gathered was species, plot size (based on vegetation, i.e. grassland, shrubland, or forest), area sampled, density, plots occurred, frequency, dbh of trees, percent cover, height, individual density cover, resource, factor and trend. Information was recorded on field forms and analyzed on forms back in the office.

RESULTS

Habitat Type Verification

Determination of habitat sites was based on range and soil surveys done in the East Socorro Grazing Environmental Statement (ES), aerial photography, and ground truthing. The SHS's and habitat sites are listed in Table 2.

The number of transects for each SHS was determined by the number of acres in each site and its potential as wildlife habitat. Also, due to the limited amount of field personnel, only fourteen sites were chosen for completed sampling during the summer months. Determining SHS's by use of two dominant vegetative types and landform is different than determining range classes by the range survey; so even though range vegetative maps were helpful, SHS's required considerable time in ground truthing.

Transect Locations

Transect locations were placed whenever possible in a homogeneous habitat. Within any SHS there are many ecosystems but the vegetative, mammal and bird transects showed little changes along transect lines indicating there was not a heterogeneous habitat. The vegetative transects showed slight changes in vegetative zones but this difference was not significant enough to change animal species composition.

TABLE 2
STANDARD HABITAT SITES AND HABITAT SITES FOR
THE STALLION PLANNING UNIT

SHS	No.	Habitat Sites	Acres
Creosote Questa	1	Creosote/Black Grama	46,874
		Creosote/Mesquite	35,149
Pseudoriparian	2		11,725
		Desert Willow/Brickdellia	20,622
		Snakeweed/Creosote	973
		Jumo/Creosote	5,722
		Oak/Alligator Juniper	474
		Rhus/Apache Plume	1,420
Malpais or Lava	3		12,033
		Tobosa/Black Grama	25,574
		Black Grama/Snakeweed	16,896
Mixed Shrub/Grass Hills	4		8,678
		Artemisa spp.	193,672
		Snakeweed/Fluffgrass	3,277
		Snakeweed/Blue Grama	3,597
		Black Grama/Prickly Leaf Dogwood	102,783
		Rhus/Juniper	1,493
		Sandsage/Sand Dropseed	1,741
		Yucca/Galleta	15,667
		Sandsage/Galleta	39,782
		Black Grama	1,433
		Sand Dropseed/Rhus	23,117
Mesquite/Rolling Upland	5		781
		Snakeweed/Mesquite	30,810
		Broomdalia/Mesquite	5,389
		Galleta/Mesquite	17,254
		Saltbush/Mesquite	2,790
			5,377

TABLE 2 (continued)
STANDARD HABITAT SITES AND HABITAT SITES FOR
THE STALLION PLANNING UNIT

SHS	No.	Habitat Sites	Acres
Grass Pediment	6	Galleta/Black Grama	185,831
		Fluffgrass/Snakeweed	79,770
		Blue Grama/Snakeweed	3,277
Shrub Pediment	7		102,784
			238,463
		Yucca/Cholla	91,853
		Yucca/Sandsage	86,093
		Yucca/Galleta	55,730
Creosote Hill	8	Cholla/Black Grama	4,787
			99,063
		Creosote/Black Grama	97,501
		Creosote/Rhus spp.	1,562
Mixed Shrub/Grass Valley	9		18,263
			18,263
Riparian	10	Cholla/Yucca	4,562
		Cottonwood/Tamarisk	4,000
		Tamarisk/Willow	562
Pinyon-Juniper Woodland	11		543,449
		Pinyon/Juniper Mesa	72,295
		Pinyon/Juniper Hills	444,172
		Pinyon/Juniper Mountains	26,982

TABLE 3
TRANSECT LOCATIONS FOR THE STALLION PLANNING UNIT

Transect No.	Range	Township	Section
Transect #1	2 E.	8 S.	5
Transect #2	1 E.	3 S.	29 & 28
Transect #3	1 E.	4 S.	19
Transect #4	1 W.	4 S.	35
Transect #5	2 E.	9 S.	5 & 6
Transect #6	2 W.	4 S.	20
Transect #7	2 W.	4 S.	21
Transect #8	7 E.	6 S.	12
Transect #9	3 E.	2 S.	28
Transect #10	3 E.	4 S.	5, 8 & 9
Transect #11	1 W.	2 S.	1
Transect #12	3 E.	4 S.	5
Transect #13	Never Run		
Transect #14	8 E.	6 S.	34
Transect #15	5 E.	5 S.	6

All transect locations were based on habitat uniformity and accessibility. All transects were located near seldom driven roads for the ease of the field personnel (Table 3). Time was a critical factor in running the transects, and having to walk a mile or two to a transect would have proved too time consuming. Transect starting points were located at least fifty meters from the edge of a road to prevent any edge effect from the existing road and ran for 1.6km away from any existing roads into the habitat site. IHICS information will be listed by SHS. Each animal and plant species observed or trapped will be listed in each SHS.

Mammals

Table 4 lists mammals that occur or are thought to occur in the Stallion Planning Unit. Most of the species except for bats and the larger mammals are mostly sedentary.

All of the bats are highly mobile and may travel many miles from their roost each night in food gathering and watering. None of the bats are found in only one SHS. They might roost in one type, water in another, and feed throughout the night in several others.

A thorough survey was done for bats and thirteen different species were encountered throughout the study area. The most diverse area for bats was in South Nogal Canyon, Township 9 S., R. 4 W., Sections 4, 3, and 2. This canyon has a perennial stream that flows through a narrow box canyon for about one-half a mile. The canyon is thick in vegetation

TABLE 4

Mammals documented or expected to occur in or immediately adjacent to Socorro County.

Common Name	Scientific Name	Species Verified By This Survey
Desert Shrew	<i>Notiosorex crawfordi</i>	
Little Brown Myotis	<i>Myotis lucifugus</i>	*
Fringed Myotis	<i>Myotis thysanodes</i>	*
California Myotis	<i>Myotis californicus</i>	*
Long-Legged Myotis	<i>Myotis volans</i>	*
Long-Eared Myotis	<i>Myotis evotis</i>	
Southwestern Myotis	<i>Myotis auriculus</i>	
Yuma Myotis	<i>Myotis yumanensis</i>	*
Small-Footed Myotis	<i>Myotis leibii</i>	
Silver-Haired Bat	<i>Lasionycteris noctivagans</i>	*
Western Pipistrelle	<i>Pipistrellus hesperus</i>	*
Big Brown Bat	<i>Eptesieus fuscus</i>	*
Red Bat	<i>Lasiurus borealis</i>	*
Hoary Bat	<i>Lasiurus cinereus</i>	*
Spotted Bat	<i>Euderma maculatum</i>	
Allen's Big-Eared Bat	<i>Idionycteris phyllotis</i>	
Townsend's Big-Eared Bat	<i>Plecotus townsendii</i>	*
Pallid Bat	<i>Antrozous pallidus</i>	*
Brazilian Free-Tailed Bat	<i>Tadarida brasiliensis</i>	*
Sylvilagus spp.	<i>Cottontail spp.</i>	
Black-Tailed Jackrabbit	<i>Lepus californicus</i>	*
Cliff Chipmunk	<i>Eutamias dorsalis</i>	*
Colorado Chipmunk	<i>Eutamias quadrivittatus</i>	
Gray-Collared Chipmunk	<i>Eutamias cinereicollis</i>	
White-Tailed Antelope Squirrel	<i>Amnospermophilus leucurus</i>	*
Texas Antelope Squirrel	<i>Amnospermophilus interpres</i>	
Thirteen-Lined Ground Squirrel	<i>Spermophilus tridecemlineatus</i>	*
Spotted Ground Squirrel	<i>Spermophilus spilosoma</i>	*
Rock Squirrel	<i>Spermophilus variegatus</i>	*
Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	*
Abert's Squirrel	<i>Sciurus aberti</i>	
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	
Botta's Pocket Gopher	<i>Thomomys bottae</i>	
Desert Pocket Gopher	<i>Geomys arenarius</i>	
Plains Pocket Gopher	<i>Geomys bursarius</i>	*
Silky Pocket Mouse	<i>Perognathus flavus</i>	*
Plains Pocket Mouse	<i>Perognathus flavescens</i>	*
Rock Pocket Mouse	<i>perognathus intermedius</i>	*
Ord's Kangaroo Rat	<i>Dipodomys ordii</i>	*
Banner-Tailed Kangaroo Rat	<i>Dipodomys spectabilis</i>	*

TABLE 4 (continued)

Common Name	Scientific Name	Species Verified By This Survey
Merriam's Kangaroo Rat	Dipodomys merriami	*
Beaver	Castor canadensis	*
Plains Harvest Mouse	Reithrodontomys montanus	
Western Harvest Mouse	Reithrodontomys megalotis	*
Cactus Mouse	Peromyscus eremicus	*
Deer Mouse	Peromyscus maniculatus	*
White-Footed Mouse	Peromyscus leucopus	*
Brush Mouse	Peromyscus boylii	*
Pinon Mouse	Peromyscus truei	*
Rock Mouse	Peromyscus difficilis	
Northern Grasshopper Mouse	Onychomys leucogaster	*
Southern Grasshopper Mouse	Onychomys torridus	*
Hispid Cotton Rat	Sigmodon hispidus	
Southern Plains Woodrat	Neotoma micropus	*
White-Throated Woodrat	Neotoma albigula	*
Mexican Woodrat	Neotoma mexicana	
Gapper's Red-Backed Mouse	Clethrionomys gapperi	
Mexican Vole	Microtus mexicanus	
Prairie Vole	Microtus ochrogaster	
Muskrat	Ondatra zibethicus	*
House Mouse	Mus musculus	
Western Jumping Mouse	Zapus princeps	
Porcupine	Erethizon dorsatum	*
Coyote	Canis latrans	*
Kit Fox	Vulpus macrotis	*
Gray Fox	Urocyon cinereoargenteus	*
Black Bear	Ursus americanus	
Ringtail	Bassariscus astutus	
Raccoon	Procyon lotor	*
Long-Tailed Weasel	Mustela frenata	*
Badger	Taxidea taxus	*
Striped Skunk	Mephitis mephitis	
Hog-Nosed Skunk	Conepatus mesoleucus	
Mountain Lion	Felis concolor	
Bobcat	Lynx rufus	
Mule Deer	Odocoileus hemionus	*
White-Tailed Deer	Odocoileus virginianus	
Pronghorn	Antilocapra americana	*

and is steep walled with many places for bats to roost. It also has two small caves that is a concentration area for several species of myotis and Antrozous Pallidus.

Thirty-six other mammals were documented during the study period. Small mammals were sampled intensively for three consecutive days on each transect to determine relative density. Other species were documented on an opportunistic basis by observation or by picking up road kills. When a species was labeled as verified it meant that a specimen had been prepared into a study skin and deposited with either the University of New Mexico or New Mexico State University.

Appendix B is a life form matrix of all mammals occurring or expected to occur in the study area.

Birds

Bird diversity was typical of the types of habitats found in the study area. The most diverse was in pinyon-juniper, riparian and pseudo-riparian habitats and the least diverse was grasslands and creosote habitats. Table 5 lists birds suspected of occurring and birds observed in the study area. No specimens were taken of birds since it is illegal. One-hundred and thirty-one species were observed in a one-year time span in the study area.

Appendix B is a life form matrix of all birds occurring in the study area. It shows which habitat and special habitat features are important for bird survival during and after the breeding season.

the black hawk, Buteo gallus anthracinus; and the Osprey, Pandion haliaetus. The bald eagle is federally endangered and was found along the Rio Grande principally in the Bosque Del Apache Refuge and Elephant Butte Marsh.

The black hawk was observed by Andy Price in August 1980 north of Elephant Butte Marsh along the river. The black hawk is considered State Endangered Group II. Only one hawk was observed by Andy Price and by his report it had been observed in the same area for several weeks.

One osprey was watched along an irrigation ditch from September 25, 1980 to October 6, 1980 inside the Socorro city limits. The osprey was observed almost every day by Jeff Connor along an irrigation ditch across from his house. The osprey was observed on two different occasions catching fish out of the ditch. What type of fish is unknown but the ditch holds water year-round and catfish and small mouthed bass have been observed by Jeff Connor in the ditch. The Osprey is State Endangered Group II.

Noticeable differences were made of summer breeding birds and wintering birds in the SHS's. One difference was between black-throated sparrows and sage sparrows. During the summer months breeding black-throated sparrows were common in many of the SHS's but during the winter they were absent and sage sparrows were common. black-throated sparrows were seen in the winter, but in only one habitat site. Sage sparrows summer in sagebrush and chaparral country moving down into the niches held by the black-throated sparrow during the winter.

Some breeding summer birds from ponderosa and fir communities were found to be wintering in lower elevations below 7,000 feet. Birds such as the western bluebird, mountain bluebird, dark-eyed Junco, Townsend's solitary, and yellow-bellied sapsucker were seen in several habitat sites during the winter months.

SHS lava and grassland pediment represented grasslands with no interspersions of pinyon-juniper and bird species found represented a grassland community except for a couple of species. The lava flow when sampled in the spring picked up two migrating species: the hermit thrush and the yellow-rumped warbler. The Rio Grande flows around the large Jornada Del Norte lava flow and migrating species may choose to fly across the lava flow instead of following the river. This lava flow could be a major migration route for migrating species but presently there is not enough data to support this idea.

In the grassland pediment habitat site one tree dwelling species was observed. This is due to widely scattered shrubs and cholla throughout the habitat site. As an example, an observation was made of a yellow-bellied sapsucker in a single mesquite with no other trees within four miles. It was observed in the fall and was obviously migrating.

Pinyon-juniper woodland showed a small difference in birds between Chupadera Mesa and the wild horse corral area. Differences are probably related to plant diversity which was significantly different with Chupadera having a higher diversity than the wild horse corral area. Plant diversity was the highest on Chupadera Mesa than any other habitat site in the study area.

Pinyon-juniper woodland and Bosque tracts along the Rio Grande supported the largest number of bird species. These two habitat sites are also the two most abused habitat sites in the study area. Trespassed woodcutting is the major contributor of loss of habitat particularly for the Bosque tracts, with canopy dwelling birds being directly affected by cutting of cottonwoods. Mature cottonwoods have large canopies and the loss of one tree opens the canopy significantly enough to alter the birds in the area. Transect 11 was run in a Bosque tract near Lemitar and in one summer's time a number of trees were illegally cut along the transect. Roads have broken the area into small plots of trees and illegal dumping of trash has altered the understory. Many of the most colorful songbirds occur in cottonwood woodlands and these birds will disappear as the woodland disappears. Any publically owned Bosque tract should be designated as a special use area (ACEC), protected and reverted back to a natural state. Any development of any kind such as making ball parks, picnic grounds or ORV use areas should be discouraged and stopped.

Bird species in the other habitat sites were representative of the type of habitat. Bird numbers were lowest in grassland communities and highest in the pinyon-juniper and riparian habitats.

Special Habitat Feature Locations

Only the following special habitat features will be identified in this survey: Cave (A02), Lava Cave (A04), Cliff (A05), Cone Volcanic (A06), Sand Dune (A08), Cold Spring (A13), Sinkhole (A14), Small Natural Ponds (A33), Small Group of Trees Riparian (A35), Raptor Nest Tree (A39), Boulder Rock Outcrop (A41), Rodent Colony (A42), Underpass (B03), Artificial Wildlife Water (B37). All other special habitat features such as roads, pipelines, fences, windmills, stock tanks are identified in other surveys and are fairly accurate on topographical maps. All District projects are identified on a JDR computer program in the Socorro District so anyone wanting to know project locations such as windmills, pipelines, fences, wildlife waters should refer to this computer file. Special habitat features are listed below by title of 15 minute topographic maps.

	<u>Special Habitat Feature</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>
Black Hill, NM	Cliff	9S	4W	3
	Cave	9S	4W	2
	Cave	9S	4W	2
	Stream	9S	4W	3
	Stream	9S	4W	2
	Cold Spring	9S	4W	2
	Small Group Trees Riparian	9S	4W	3
	Small Group Trees Riparian	9S	4W	2
	Small Group Trees Riparian	9S	4W	4
Granjean Well, NM	Salting Area	9S	3E	8
	Salting Area	9S	3E	9
	Salting Area	9S	3E	4
Val Verde, NM	Crater	9S	1E	10
	Crater	9S	1E	17
	Cave	9S	1E	17
	Raptor Nest Tree	7S	1E	27
	Cave	9S	1E	19
	Raptor Nest Tree	8S	1E	14
	Raptor Nest Tree	8S	1E	19

	<u>Special Habitat Feature</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>
Loma de las Canas, NM	Cliff	3S	1E	28
	Cold Spring	3S	2E	19
	Stream	3S	2E	19
	Stream	3S	1E	25
	Small Natural Pond	3S	1E	12
	Small Natural Pond	3S	1E	11
	Cliffs	3S	2E	17
	Cold Spring	2S	2E	30
	Cold Spring	2S	1E	26
	Cold Spring	2S	1E	27
	Cold Spring	2S	1E	23
	Cliffs	2S	1E	33
	Cliffs	3S	1E	9
	Mine Shaft	3S	1E	2
	Dry Spring	3S	1E	13
	Cliffs	3S	2E	30
Bustos Well, NM	Cliffs	3S	3E	30
	Cliffs	3S	3E	31
	Cliffs	3S	2E	4
	Cliffs	3S	2E	9
	Cliffs	2S	2E	35
	Cold Spring	2S	2E	23
	Raptor Nest Tree	2S	2E	23
	Sinkhole	2S	3E	28
	Cave	2S	3E	33
	Cliffs	3S	2E	25
	Cliffs	3S	2E	36
San Antonio, NM	Bat Cave	4S	1W	33
	Cliff	4S	1W	33
	Cliff	5S	1W	4
	Cliff	5S	1W	5
	Cold Spring	5S	1W	6
	Cold Spring	4S	1W	5
Sierra De La Cruz, NM	Seep	2S	2E	23
	Cliffs	2S	3E	17
	Cliffs	2S	2S	8
	Cliffs	1S	2E	36
	Cliffs	1S	2E	33
	Cliffs	1S	2E	28
Mesa Del Yeso, NM	Cliffs	2S	1E	16
	Cliffs	2S	1E	15
	Cliffs	2S	1E	21
	Cliffs	2S	1E	20
	Cliffs	1S	1E	35
	Cold Spring	2S	1E	14
	Cold Spring	2S	1E	12

	<u>Special Habitat Feature</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>
Socorro, NM	Warm Spring	3S	1N	21
	Warm Spring	3S	1N	21
	Cliffs	3S	1W	21
	Small Group Trees Riparian	3S	1W	21
	Cliffs	3S	1N	16
	Cliffs	3S	1W	9
	Cold Spring	2S	1W	31
Rayo Hills, NM	Cliffs	1N	5E	29
	Cliffs	1N	5E	32
	Cliffs	1N	5E	33
Molino Peak, NM	Cold Spring	2W	5S	8
	Cliffs	2W	5S	5
	Cliffs	2W	4S	30
	Cold Spring	2W	4S	7
	Boulder Rock Outcrop	2W	4S	20
	Cliffs	2W	4S	20
Scholle, NM	Cold Spring	2N	4E	12
	Cold Spring	2N	5E	4
Cienega Ranch, NM	Cold Spring	5S	3W	14
Sierra Larga North, NM	Cliffs	2S	3E	1
	Cliffs	2S	3E	12
	Cliffs	2S	3E	13
	Cliffs	1S	3E	36
	Cliffs	1S	3E	35
	Cliffs	2S	3E	3
Sierra Larga South, NM	Cliffs	3S	4E	6
	Cliffs	3S	4E	7
	Cliffs	3S	4E	18
	Cliffs	3S	4E	5
	Cliffs	3S	4E	8
	Cliffs	3S	4E	17
	Cliffs	2S	4E	30
	Cliffs	2S	4E	31
	Cold Spring	3S	4E	29
Carthage, NM	Cliffs	5S	2E	4
	Small Natural Pond	5S	2E	4
	Small Group Trees Riparian	5S	2E	4
	Cliffs	4S	2E	3
	Small Group Trees Riparian	5S	2E	10
	Climb Swallow Nesting Colony	5S	4E	16
	Climb Swallow Nesting Colony	5S	4E	18
	Underpass	5S	4E	16
	Underpass	5S	4E	18
	Raptor Nest Tree	5S	2E	1

	<u>Special Habitat Feature</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>
Bingham, NM	Cliff Swallow Nesting Colony	5S	5E	17
	Underpass	5S	5E	17
Orndorff Ranch, NM	Cliffs	2S	4E	25
	Cliffs	2S	4E	35
	Cliffs	2S	4E	36
Carthage	Rodent Colony	4S	3E	5
Molino Peak, NM	Rodent Colony	4S	2W	21

Reptiles and Amphibians

The census data for each transect are shown in Table 7. Each transect was censused at least once. Time and budgetary constraints prevented any additional censusing of the transects; this is unfortunate, as levels of reptile and amphibian activity can undergo marked, short-term fluctuations in response to localized environmental conditions. Time and budgetary constraints, again, dictated the use of line transect sampling methods in this study. These methods are valid (Medica et al, 1971; Mitchell, 1979; Burnham et al, 1980) but, as discussed by these authors and through the personal experience of Andy Price, much inferior to mark recapture methods for estimating population densities because:

- 1) Not every lizard in the population will be active at the same time on the same day;
- 2) Not every lizard active has an equal chance of being seen by the observer and it is not a certainty that every lizard active will be seen by the observer, and;
- 3) The observer contributes some variability to the observing process. The density estimates presented here should be considered minimum values and are simply the number of animals seen within the area covered when walking the transect, converted to lizards per hectare (Mitchell, 1979). They lack a statistical foundation. Burnham et al (1980) discusses a computer program developed to utilize line-transect data for estimating population densities with a statistical underpinning. Data taken in

TABLE 7
TRANSECT CENSUS DATES FOR REPTILES

Transect	1980		
	1st	2nd	3rd
#1 (Harriet Yucca)	22 May	22 July	
#2 (Arroyo de las Canas)	18 June		
#3 (Bosquecito, Mesquite Hills)	28 May		
#4 (San Antonio Creosote)	21 May	15 July	
#5 (Lava Flow)	23 May		
#6 (Madera Canyon)	19 June		
#7 (Madera, Cholla)	19 June		
#9 (Bustos Well)	1 July		
#10 (Jones, Rach, Alkali Sacaton)	29 May	16 July	
#11 (Lemitar)	11 June		
#12 (Jones, Cuesta)	30 May		
#8 (Oscura PJ)	4 June		
#14 (Oscura Cholla)	5 June		
#15 (Bingham Wolfberry)	30 July		

TABLE 8

SNAKES COLLECTED/OBSERVED DURING 1980 IHICS,
Jornada Resource Area

Number of Trips Species	(14)		(3)		(1)	
	U.S. Hwy. 380 AOR	DOR	NM Hwy. 1 AOR	DOR	U.S. Hwy. 60 AOR	DOR
<u>Arizona elegans</u>	4	6	1			
<u>Gyalopion canum</u>	1					
<u>Heterodon nasials</u>		1				
<u>Hypsiglena torquata*</u>	2	1				
<u>Lampropeltis getulus</u>	1	4	1			
<u>Lampropeltis triangulum*</u>		1				
<u>Masticophis flagellum</u>				1		
<u>Pituophis melanoleucus</u>					1	
<u>Rhinocheilus lecontei</u>	3	7				
<u>Tantilla nigriceps</u>	3	2	1			
<u>Thamnophis* marcianus</u>		3	1	1		
<u>Crotalus* atrox</u>	2	1	1			
<u>Crotalus viridis*</u>		6	3			

TABLE 9

"DENSITY ESTIMATE" OF SNAKES ENCOUNTERED ON U.S. HWY. 380
BETWEEN SAN ANTONIO AND BINGHAM

<u>Arizona elegans</u>	28.6/km ²
<u>Gyalopion canum</u>	2.86/km ²
<u>Heterodon nasicus</u>	2.86/km ²
<u>Hypsiglena torquate</u>	23.1/km ² (excludes Jornada del Muerto Plain).
<u>Lampropeltis getulus</u>	14.3/km ²
<u>Lampropeltis triangulum</u>	3.0/km ² (excludes Rio Grande floodplain).
<u>Pituophis melanoleucus</u>	8.6/km ²
<u>Rhinocheilus lecontei</u>	28.6/km ²
<u>Tantilla nigriceps</u>	14.3/km ²
<u>Thamnophis marcianus</u>	150/km ² (includes only Rio Grande floodplain).
<u>Crotalus atrox</u>	23.1/km ² (excludes Jornada del Muerto Plain).
<u>Crotalus viridis</u>	18/km ² (excludes Rio Grande Floodplain).

this study will allow the computation of lizard densities with this program for most of the transects covered. Careful consideration should be paid to the underlying assumptions necessary for estimates made using these techniques to be valid, however, if they are to be used on these or any other data in the future. This computer program is currently under study for acquisition and/or development by the BLM at the Denver Service Center (Center personnel; personal communication).

Most species of snakes that occur in the Jornada Resource Area are primarily nocturnal in their habits. This fact plus other facets of their biology renders snakes particularly unsuceptible to conventional methods for censusing vertebrate animal populations. Driving paved roads at night looking for snakes has been done for some 50 years and continues to be the most reliable method for determining the species composition and relative abundancies of snake faunas of the desert, although other methods may be more suitable for estimating population densities for individual species. It would seem in view of this that a "density estimate" based on relative abundancies determined in this manner could logically be made and would be a useful piece of information to have in attempting to manage the wildlife resources in any given area. The total number of each species of snake collected and/or observed in this study are shown in Table 8 and a "density estimate" for the San Antonio-Bingham route is given in Table 9. The densities given for each species obviously have no statistical value; snakes seen on many separate trips are included in one estimate and both live and road-killed snakes were counted. The estimates however, are a useful indication of the relative abundancies and composition of the snake fauna of the Resource area. The estimates are based on the

total number of each species encountered and the area covered by this route, which is a width of approximately 7.3 meters and a length of approximately 48,000 meters.

The route passes eastward through what is considered to be three distinct habitat types. These are the Rio Grande Flood Plain, dominated by Populus and Tamarix (about 3,200 m); rocky, gravelly, alluvially-dissected rolling hills dominated by Larrea and Prosopis (about 14,400 m); a relatively flat relatively sandy plain dominated by various grasses, Yucca and Ephedra with scattered Rhus and Juniperus at the extreme eastern end (about 30,400 m). There are several species indicated by asterisks in Table 8, that appeared to be restricted to one or the other of these habitats and their density figures were computed accordingly.

One cautionary note before proceeding to transect and species accounts: 1980 was a drought year, with unusually hot and dry conditions (even for the desert in New Mexico), particularly during the spring and summer months which are most important in activity to reptiles and amphibians. This has an adverse effect on these animals more so than on birds and mammals. Reptiles and amphibians will be active for shorter periods of time on both 24-hour and seasonal basis under these conditions than during milder or even normal years. This should be kept in mind when looking at this data in the future.

Reptile and Amphibian Species Occurrence

Ambystoma tigrinum (Tiger Salamander). Found wherever water occurs on at least an intermittent basis and where the soil is suitable for burrowing; adults may occasionally be found traveling between such sites. Eggs must be laid and larvae/neotenic adults live in bodies of water, preferably slow-moving or stagnant ones. Populations west of the Rio Grande would historically be assigned to the subspecies nebulosum (Arizona) and those east to the subspecies mayortium (Barred); human activity, particularly that of bait dealers and fisherman, have probably rendered such assignment meaningless.

Scaphiopus bombifrons (Plains Spadefoot Toad). Usually found in open grassy plains with sandy or gravelly soil suitable for burrowing. Like the other spadefoots, it spends a great majority of its life inactive underground, appearing on nights of high humidity and especially during summer rains, when it breeds in temporary pools. To be expected in transects 1, 3, 7, 10, 14, and 15.

Scaphiopus conchi (Couch's Spadefoot Toad). Found in a wide variety of desert situations. Quite common throughout the Resource Area, where it approaches the northern limits of its distribution in New Mexico. To be expected in transects 1, 2, 3, 4, 6, 7, 10, 12, 14, and 15.

Scaphiopus hammond (Western Spadefoot Toad). Quite similar to the plains spadefoot in habitat requirements, although perhaps a bit more cosmopolitan. Tolerates human agricultural activities a bit better. To be expected in transects 1, 3, 7, 10, 11, 14, and 15.

Bufo cognatus (Great Plains Toad). Primarily a grassland species, it is an excellent burrower and may be found anywhere the soil is conducive to this. Also found around ponds and irrigation ditches in agricultural areas. To be expected in transects 1, 2, 3, 4, 7, 10, 11, 12, 14 and 15.

Bufo debilis insidiosus (Western Green Toad). Very similar to spadefoots in habits, this species is found in relatively flat desert areas in and around playas. It can be particularly abundant during the rainy season when water has accumulated into broad shallow lakes. It reaches its northern distributional limits in our area and can be expected to occur in suitable habitats only in the extreme southern and southeastern portions of the Resource Area, if at all. To be expected in transects 1, 3, 10, and 15.

Bufo punctatus (Red-Spotted Toad). Generally associated with rocky areas, where it occurs around almost any source of water. May be found in open creosote-desert areas, but even here associated with rocky soil and water sources such as arroyos. To be expected in transects 2, 4, 5, 6, 8, 9, 11, and 12.

Bufo woodhousei australis (Southwestern Woodhouse's Toad). More than any other species of this genus that occurs in the Resource Area, this one is dependent upon relatively large, semi-permanent or permanent bodies of water and benefits greatly by human agricultural activity. It is most abundant in the Rio Grande Valley and floodplain and may extend up watercourses draining into them. Not a species of the open desert. To be expected in transects 2, 4, 6, and 11.

Rana catesbeiana (Bullfrog). This species may be found, even in extremely arid situations, anywhere a source of permanent water exists. It was common at Torreon Springs during bat-netting activities there and is undoubtedly common in areas like the Bosque del Apache Refuge. It is an introduced species and appears to be displacing the native species of the Rana pipiens complex throughout the Rio Grande Valley.

Rana pipiens (Leopard Frog). This species is very similar to the bullfrog in habitat requirements, except that it can be found in smaller, less permanent bodies of water. It does seem to be displaced by the bullfrog throughout much of its range in the Rio Grande Valley. This species is actually a complex of at least 4 district species in New Mexico; the status of the populations that may exist in the Resource Area must await further investigations.

Hyla arenicolor (Canyon Treefrog). Essentially a frog of small, permanent or semi-permanent rock bottom canyon streams ranging through the Upper Sonoran and Transition Life Zones. An individual was collected and several others heard during bat-netting activities in Nogal Canyon (the large, southernmost one) in June. This is probably the easternmost extension of this species in the Resource Area; it undoubtedly does not occur east of the Rio Grande. To be expected in transects 2 and 6 within this limited zoogeographic range.

Chrysemys picta belli (Western Painted Turtle). A turtle of quiet bodies of water of almost any size. It can be found in irrigation canals, ponds, and other locales that have seasonal water as long as there are

other bodies of water within migratory distance. To be expected only in the Rio Grande Floodplain in the Transect Area (11).

Chrysemys scripta gaigeae (Big Bend Slider). Found only in the Bosque del Apache National Wildlife Refuge but may exist elsewhere in the area.

Trionyx spiniferus emoryi (Texas Spiny Softshell Turtle). A turtle of river systems, in this case the Rio Grande and any bodies of water in some way directly connected. Not to be expected elsewhere.

Terrapene ornata luteola (Desert Box Turtle). A turtle of open desert-grasslands, in the Resource Area essentially confined to the Jornada del Muerto and quite common there. Requires loose soils in which to excavate or burrow. Active mainly in the early morning and after rainstorms. Agricultural activities seem to be detrimental to this species. It reaches the northwestern limits of its range in the Resource Area, and will not be found north of the Jornada del Muerto or west of the Rio Grande. To be expected in transects 1, 3, 10, 14, and 15.

Crotaphytus collaris baileyi (Western collared Lizard). A lizard frequenting a wide variety of rocky-terrain type habitats and quite abundant in all of them. Jumbled boulder piles or rocky alluvial fans are favorite habitats, and ground cover is usually sparse, even in areas of pinyon-juniper, where it occurs. Tolerant of, ever requiring, moderately high temperatures. To be expected in transects 2, 4, 5, 6, 7, 8, 9, 12, 14, and 15.

Gambelia wislizenii wislizenii (Turquoise Leopard Lizard). This species is found in the low desert, often where vegetation is sparse. Soil is generally sandy or gravelly. Its abundance is hard to determine, as it is not a conspicuous animal anywhere, often remaining motionless in partial shade waiting for prey to pass by. To be expected in transects 1, 2, 3, 4, 6, 7, 10, 11, 14, and 15.

Phrynosoma cornutum (Texas Horned Lizard). This species, as the other of this class in our area, feed on ants and can be found wherever these insects are active and abundant. This species can be found in low flat deserts up to 1,846 m. in elevation, generally where the vegetation cover is sparse, with the notable exception of the river valley. Soil composition can be variable, but generally there is loose soil available for burrowing or burrows available in which to take shelter. This species requires warm temperatures to be active and is often seen on the edges of paved roads soaking up heat absorbed by the surface. To be expected in transects 1, 2, 3, 4, 7, 10, 11, 12, 14, and 15.

Phrynosoma douglassi hermandesi (Mountain Short-Horned Lizard). More of an upland species tolerant of cold temperatures than others, it occurs up to the highest elevations in the Resource Area, but especially in pinyon-juniper associations with loose soil. To be expected in transects 6, 8, 14, and 15.

Phrynosoma modestum (Roundtail Horned Lizard). Occurs on flat desert areas with sandy or gravelly soil and shrubby vegetation (may be ocotillo, Rhus prosopis, Larrea, etc.). To be expected in transects 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, and 15.

Holbrookia maculata approximans (Speckled Earless Lizard). Occurs in open desert-grasslands, arroyos, and river floodplains, chiefly where the soil is sandy. Common, even abundant, in these habitats, individuals blend in well with their substrate they are often overlooked unless flushed. Often remaining motionless with the body buried in the sand and only the head exposed. To be expected in transects 1, 3, 7, 10, 11, 14, and 15.

Cophosaurus texanus scitulus (Holbrookia texana scitula) (Southwestern Earless Lizard). One of the most abundant species in habitats where it occurs. Found in the lower elevations of the Resource area, always associated with rocky areas (streambeds, arroyos, rocky hillsides), even jumbled boulder fields. To be expected in transects 2, 4, 5, 6, 9, 11, and 12.

Uta stansburiana steinegeri (Desert Side-blotched Lizard). Another of the most abundant species where it occurs; in all possible habitats in the Resource Area except the highest reaches in the pinyon-juniper zone. Active year-round on warm days, never found far from shelter (a burrow or clump of vegetation). To be expected in transects 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, and 15.

Urosaurus ornatus (Tree Lizard). A species particularly common in riparian habitats, whether with permanent or intermittent water. It also occurs on rocky mountainsides. Always found either on trees or on large boulders. Can be quite numerous, it was only seen with frequency in Madera Canyon during this study. To be expected at higher elevations in the Resource Area, and in transects 2, 5, 6, 8, 9, 11, and 12.

Sceloporus magister bimaculosus (Twin-Spotted Spiny Lizard). A lizard of lower desert areas, generally where vegetation is dense. Never found in the open. Favorite haunts include creosote, mesquite and desert willow trees. Usually associated with gravelly soil; common in arroyos and on alluvial fans. May not occur outside of the Rio Grande floodplain and associates in the Resource Area, as it may be reaching its altitudinal limit of 1,231-1,538m. To be expected in transects 2, 3, 4, 5, 6, 11, 12, and 15.

Sceloporus poinsetti poinsetti (Crevice Spring Lizard). A lizard of rocky outcrops, canyons and hillsides - anywhere there is an abundance of rock crevices in which to seek shelter. May be approaching the northern limits of its distributional range in our area. It was seen only in Madera Canyon during this study. To be expected in transects 5, 6, 8, 9, and 12.

Sceloporus undulatus consobrius (Southern Prairie Lizard) and Sceloporus undulatus tristichus (Southern Plateau Lizard). This species will be found throughout the Resource Area; the former subspecies at lower elevations primarily in the southeast half of our area and the latter at higher elevations primarily in the northwest half of our area. Occurs from pinyon-juniper associations to cultivated farmlands.

Eumeces multivirgatus epipleurotus (Variable Skink). To be expected in all habitats and throughout the elevational range of the Resource Area. Most common in mesic areas or where the subsoil is moist. Secretive,

probably most active in the early morning hours. Not found during this study. The use of pitfall traps would be most useful in verifying the presence of this and the following species.

Eumeces obsoletus (Great Plains Skink). Found in the Resource Area along rocky, permanent or semi-permanent water course, around heavily vegetated borders of desert playas and in the Rio Grande floodplain. Secretive, active only in the early morning or late evening and during periods of high relative humidity. To be expected in transects 1, 2, 3, 4, 6, 7, 10, 11, 12, 14 and 15.

Cnemidophorus inornatus arizonae (Arizona Striped Whiptail). Commonly found in heavily vegetated desert grasslands with sandy or silty soil. May be found where such conditions are superimposed on otherwise unfavorable habitat, such as the edges of the Jornada del Muerto lava flows. To be expected in transects 1, 3, 5, 7, 10, 11, 12, 14, and 15.

Cnemidophorus tigris marmoratus (Marbled Whiptail). A whiptail of relatively open areas dominated by Larrea and/or Prosopis regardless of soil type. Thrives and is active at shade temperatures of 100 degrees F. or more. To be expected in transects 1, 2, 3, 4, 5, 7, 10, 11, and 12.

Cnemidophorus tesselatus (Checkered Whiptail). Found in this study in four habitat types; transects 2, 6, 11, and 12 (substitute names). Always associated with areas of historically perpetual disturbance, such as the Rio Grande floodplain and other transient watercourses, or rocky areas. More than any other member of the genus, occurs in small, localized populations. Parttionogenetic. To be expected in transects 2, 4, 5, 6, 9, 11, 12, and 14.

Cnemidophorus neomexicanus (New Mexico Whiptail). A lizard of perpetually disturbed areas with sandy soil. Major portion of its distribution encompasses the Rio Grande floodplain. Also found around the edges of playas, in closed desert basins, and on sandy alluvial deposits. Human ecological disturbance favors this species. Parthenogenetic. The type locality for this species occurs within the Resource Area. To be expected in transects 1, 2, 3, 4, 10, 11, 14, and 15.

Cnemidophorus uniparens (Desert-Grassland Whiptail). A lizard of desert and mesquite grasslands where cover is fairly dense, but occasionally where cover is sparse. This species tends to replace C. inornatus in habitats that are disturbed beyond an as yet unknown threshold. It extends up watercourses in pinyon-juniper habitats in some areas. Parthenogenetic. It reaches the northern limits of its distribution in our area. To be expected in transects 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 14.

Cnemidophorus exsanguis (Chihuahuan Spotted Whiptail). Usually found on rocky hillsides and canyon bottoms in the Transition Life Zone, but can also occur on grassy mountain slopes in the Upper Sonoran Life Zone. It can also be found along the Rio Grande where gallery forests still occur. The type-locality for this species is Socorro. Parthenogenetic. To be expected in transects 2, 6, 8, 9, 11, 14, and 15.

Gerrhonotus icingi nobilis (Arizona Alligator Lizard). Found in rocky forested mountain areas (botti, deciduous and coniferous) usually not far from water. Secretive, it also may extend into lower elevations along major drainageways. Its occurrence in the Resource Area is speculative;

it reaches the northern and eastern limits of its distribution in southwestern Socorro County. It does not occur east of the Rio Grande. To be expected in transects 6, 8, and 9.

Thamnophis marcianus marcianus (Checkered Garter Snake). Chiefly a desert-grassland species occurring wherever water is present, at least below the surface. It is expanding its range through irrigation practices. Common in the Rio Grande floodplain. To be expected in transects 2 and 11.

Thamnophis cyrtopsis cyrtopsis (Western Blackneck Garter Snake). Found in a wide variety of habitats, from low desert to the pinyon-juniper zone in our area, usually in the vicinity of water even if intermittent in nature. It will wander away from such restrictions during wet weather. Not as abundant as the Checkered Garter Snake. To be expected in transects 2, 3, 4, 6, 8, 9, 10, and 11.

Thamnophis elegans vagrans (Wandering Garter Snake). Occurs in forested regions and/or at high elevations in New Mexico. Not a desert snake; it is known from suitable habitat to the north, east and west of the Resource Area. Its occurrence in the Resource Area is conjectural. To be expected in transects 2, 6, 8, and 9.

Thamnophis sirtalis ornata (New Mexico Garter Snake). A species restricted to the Rio Grande floodplain and large tributaries; never far from a source of permanent water. Very aquatic; it is difficult to capture. Appears to be spotty in distribution, although locally abundant. To be expected in transects 2 and 11.

Heterodon nasicus nasicus (Plains Hognose Snake). An arid-zone species, found in regions of sandy or gravelly soil suitable for burrowing. Habitats include open grasslands, water courses, and farmlands. Partial to toads as food, can be expected wherever they occur in numbers. Uncommon, but not rare. To be expected in transects 1, 2, 3, 4, 6, 7, 10, 11, 14, and 15.

Diadophis punctatus regalis (Regal Ringneck Snake). A secretive species of moist habitats, seldom found in the desert except along water courses. Found more commonly in forested regions in our area but patchy in distribution. To be expected in transects 2, 4, 6, 8, 9, and 11.

Masticophis flagellum (Coachwhip). This species is one of the few in our area that will be found active throughout the day, even in the hottest parts of the summer. It occurs in all habitat types in the Resource Area, up to an elevational limit around 1,846m. Individuals on the Jornada Lava Flow may be melanistic. Our area lies in a wide zone of intergradation between two subspecies, but the individuals observed more closely resemble M. f. testaceus, the Western Coachwhip.

Masticophis taeniatus taeniatus (Desert Striped Whipsnake). Another diurnal species, this snake occurs in all habitat types in the Resource Area. Individuals are often found perched in the top of vegetation, from creosotebrush to juniper trees. Partial to rocky areas and intermittent water courses.

Salvadora deserticola (Big Bend Patchnose Snake). Yet another diurnal species, feeding mainly on lizards. Occurs in a wide variety of low desert habitats, never extending into mountainous regions, although it may be found in desert mountains with vegetation characteristics of the Upper Sonoran Life Zone. Found in the southern portion of the Resource Area if at all as it approaches the northern limits of its distribution here. To be expected in transects 1, 2, 3, 4, 5, 7, 10, 11, and 15.

Salvadora grahamiae grahamiae (Mountain Patchnose snake). A species of roughland habitats - usually rocky and above 1,231 m. elevation. Diurnal. To be expected in transects 2, 5, 6, 7, 8, 9, 12, and 14.

Arizona elegans philipi (Painted Desert Glossy Snake). A common nocturnal desert snake, occurring most often in open areas where the soil is sandy or loamy, suitable for burrowing. Adults of this species become inactive during the hottest part of the summer. To be expected in transects 1, 2, 3, 4, 5, 10, 11, and 15.

Pituophis melanoleucus affinis (Sonoran Gopher Snake). An extremely common snake, occurring in all habitats within the Resource Area. Active chiefly by day except during the hottest part of the summer. Individuals can be found active on warm days throughout the year.

Lampropeltis getulus splendida (Desert Kingsnake). A nocturnal species active at lower temperatures than many other nocturnal desert snakes. Common in the Rio Grande floodplain and in sandy desert

grasslands, but found in other habitats in the Lower and Upper Sonoran Life Zones as well. Often active after summer showers and rainstorms. To be expected in transects 1, 2, 3, 4, 5, 6, 7, 10, 11, 14, and 15.

Lampropeltis triangulum celaenops (New Mexico Milk Snake). An extremely secretive snake, known only in the state by a dozen or so specimens. Not previously known in the District until a single specimen was collected during this study on U.S. Highway 380, in the northern portion of the Jornada del Muerto. Probably found throughout that area as well as in higher elevational and mountainous areas. To be expected in transects 1, 3, 6, 7, 8, 9, 10, 14, and 15.

Sonora semiannulata blanchardi (Trans-Pecos Ground Snake). A secretive, nocturnal, burrowing species found, in the area, generally in loose rocky soil. Probably abundant as pit-fall trapping turns this species up in numbers in places where it otherwise is not encountered. It reaches the northernmost limits of its distribution in our area and probably does not occur west of the Rio Grande in the Resource Area. To be expected in transects 1, 2, 3, 4, 5, 6, 7, 10, 11, and 15.

Rhinocheilus lecontei tessellatus (Texas Longnose Snake). A common, nocturnal snake found at low elevations in open desert, grassland and brushland. Soil must be suitable for burrowing, but not necessarily sandy. To be expected in transects 1, 3, 4, 7, 10, and 15.

Gyalopion canum (Western Hooknose Snake). Assumed to be restricted to the Rio Grande Valley in the Resource Area. The specimen collected

during this study was collected at the eastern edge of the Jornada del Muerto on U.S. Highway 380. Known to occur where shrubby vegetation is prominent (Yucca-Larrea-Prosopis-Rhus-Juniperus). Soil may be rocky, gravelly, or sandy. Secretive and nocturnal. Individuals that were encountered have always been active on warm, humid nights with considerable lightening activity. To be expected in transects 1, 2, 3, 4, 7, 10, 14, and 15.

Tantilla nigriceps nigriceps (Plains Blackhead Snake). A common nocturnal snake of the Rio Grande floodplain, rocky creosotebush desert and open grassland. Secretive and burrowing, sometimes patchy in distribution, absent from seemingly suitable habitat. To be expected in transects 1, 2, 3, 4, 6, 10, 11, and 15.

Hypsiglena torquata jani (Texas Night Snake). Common in our Resource Area in gravelly soil areas nominated by creosotebush (Larrea). Found elsewhere in a variety of habitats. Nocturnal. To be expected in transects 2, 4, 5, 6, 7, 8, 9, 11, 12, and 14.

Trimorphodon biscutatus vilkinsoni (Texas Lyre Snake). Nocturnal, it is found in broken rocky terrain, below forested mountainous regions, in rocky canyons, talus piles, base of cliffs and the like. Known from New Mexico as far north as Elephant Butte, its existence in the Resource Area is conjectural at best. To be expected in transects 2, 4, 5, 6, and 12.

Leptotyphlops dulcis dissectus (New Mexico Blind Snake). This species is entirely fossorial, coming only rarely to the surface after rains. It is assumed to be restricted to the Rio Grande Valley in our area; however, it can be expected to occur anywhere the soil is suitable for burrowing and there is a good deal of subsurface moisture. Introductions are possible through movements of large amounts of soil.

Sistrurus catenatus edwardsi (Desert Massasauga). A desert-grassland species, it is less tolerant of arid conditions than other rattlesnakes in our area. It occurs in dense growth in the Rio Grande Valley and around the edges of desert playas, anywhere water is likely to occur on at least an intermittent basis. Likely to occur as isolated populations. To be expected in transects 1, 3, 5, 10, and 11.

Crotalus viridis viridis (Prairie Rattlesnake). A desert-grassland species found in all habitat types within the Resource Area, including pinyon-juniper woodland. Most common in grassland areas with scattered shrubby vegetation. It is apparently being displaced by the Western Diamondback in these areas when they are overgrazed and invaded by creosotebush.

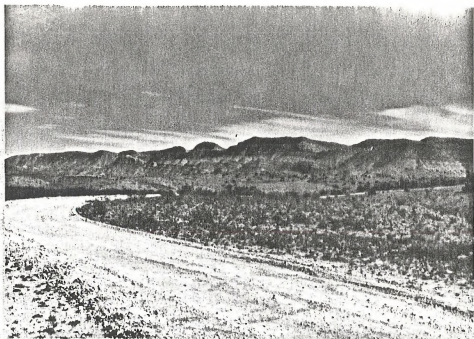
Crotalus molossus molossus (Northern Blacktail Rattlesnake). An upland species in our area, found primarily in rocky areas from the cactus-yucca-mesquite association of foothills and bajadas (ca. 1,240m.) to the pine-oak belt (ea. 2,325m.). Not common in the Resource Area, its numbers may be declining. To be expected in transects 5, 6, 7, 8, 9, and 12.

Crotalus lepidus Klauberi (Banded Rock Rattlesnake). A species of rock piles, talus slopes and cliffs found from the Transition Zone upwards. Probably very uncommon in the Resource Area. To be expected in transects 6, 8, 9, and 12.

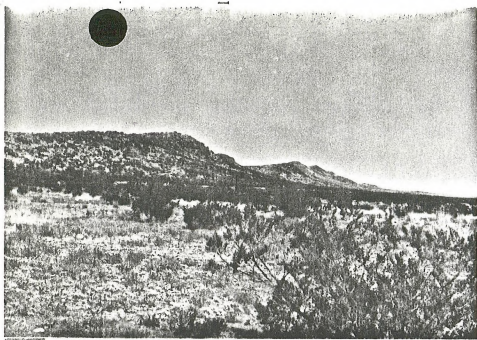
Crotalus atrox (Western Diamondback Rattlesnake). Found in all habitat types within the Resource Area, usually complementary in abundance to the Prairie Rattlesnake. A common snake, it favors rocky to gravelly terrain dominated by creosote and mesquite, arroyos, and thick bosque along the Rio Grande. The population in the Jornada Lava Flow may be melanistic.

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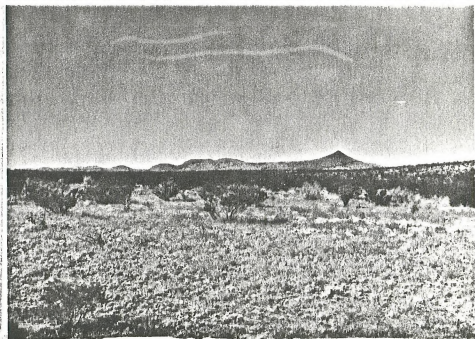
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Upper Left Transect #12 Beginning
 Upper Right Creosote Questa Habitat
 Lower Right Transect #12 Direction
 Circle is Landmark Reference



TYPICAL CREOSOTE QUESTA HABITAT



JORNADA STANDARD HABITAT SITES
Standard Habitat Site #1

Creosote Questa

Habitat Description:

This habitat site is located roughly in the middle of the Stallion Planning Unit, north of Highway 380. For the most part the Questas slope gently to the east and have steep western-facing sides. It is desert shrubland composed of creosote and black grama with a small number of one-seeded junipers scattered along some arroyos and along the ridge tops. Water is scarce with the only source being a few windmills. The steeper east-facing sides often make suitable cliffs for raptors.

Total number of acres is 46,874 with two habitat sites; one of creosote black grama Questa, 35,149 acres; and the other mesquite, black grama, Questa 11,725 acres.

Birds

A fairly diverse bird community was found in this habitat during the summer. Black-throated sparrows are the most common birds found in the creosote during the summer but were absent during the winter. Black-throated sparrows are directly associated with creosote and the numbers in this creosote community were comparable to other areas with creosote. The bird numbers were a little lower than in Transect #4 which is in Creosote Hills. This is probably due to a more diverse habitat and other birds such as the rock wren were able to compete with black-throated sparrows for territories. The few trees in the area along the rim led to the presence of the Scott's oriole and ash-throated flycatcher. Many of the birds present in the summer were gone in the winter. Lack of a food source in the winter leads to the absence of birds. Tables 10 and 11 give bird data for Transect #12.

TABLE 10

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #12	Date	Species	Summer			Winter		
			Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
	2 Dec. 1980	Verdin				4	.1	40
	2 & 4 Dec. 1980	Unknown Sparrow				12	.15	80
	13-15 May 1980	Brewer's Sparrow	5	.167	30	12	.25	48
	3 Dec. 1980							
	13-15 May 1980	Loggerhead Shrike	3	.50	5	4	.125	32
	2 Dec. 1980							
	13-15 May 1980	Rock Wren	65	.260	250	4	.1	40
	3 Dec. 1980							
	13-15 May 1980	Black-throated Sparrow	140	.222	631			
	13-15 May 1980	Mockingbird	15	.250	60			
	13-15 May 1980	Horned Lark	10	.333	30			
	13-15 May 1980	Chipping Sparrow	3	.1	30			
	13-15 May 1980	Scott's Oriole	3	.250	10			
	13-15 May 1980	Scaled Quail	3	.250	10			
	13-15 May 1980	Ash-throated Flycatcher	3	.250	10			
	13-15 May 1980	Hummingbird Sp.	3	.10	30			

TABLE 11

BREEDING (B), PROBABLE BREEDING (PB), NON-BREEDING (NB) AND
BIRDS SEEN FLYING OVER TRANSECT #12

Verdin	NB observed winter only
Barn Swallow	3 observed flying over transect 15 May 1980
Brewer's Sparrow	B
Loggerhead Shrike	B
Rock Wren	B
Black-Throated Sparrow	B
Mockingbird	B
Horned lark	PB
Chipping Sparrow	PB
Scott's Oriole	B
Scaled Quail	PB
Ash-Throated Flycatcher	PB
Hummingbird sp.	PB

Mammals

In sandy soil and along arroyos at the beginning of the transect *Dipodomys merriami* were common with colonies found in numerous areas. In the rocky areas *peromyscus eremicus*, *neotoma albigula*, and *peromyscus truei* were common. *Onychomys torridus* was found in association with *Dipodomys merriami*. Population densities are good in this type of habitat with the higher densities coming from the *Peromyscus* species in the rocky areas (Table 12). Pronghorn sign was found along the transect line on several occasions. Pronghorn are using the edge of the creosote Questa habitat periodically. They utilize the grasslands just to the south the majority of the time. Mule deer have been observed farther into the habitat. The mule deer probably do not use the area primarily but move through the area from arroyo to arroyo or while heading for a water source. Forbs are high enough in this habitat to have deer and pronghorn use the area for a food source. There is probably an overlapping of food for the two animals but competition is most likely low. Most of this habitat is not grazed during the summer months by cattle so wildlife do not have to compete with cattle for forbs, browse or grasses. There is a lack of browse, so the deer are most likely using more forbs than normally would be used in a better habitat.

Vegetation

A vegetation transect showed a good source of grasses and forbs; however, canopy cover was low with a lot of bare ground (Table 13).

Creosote was found to be $42/100\text{m}^2$ which was higher than in the creosote hill habitat. This gives more of a canopy for bird species and might be an indication of more soil than the creosote hill habitat. Eight different grasses were found with black grama being the most common. The grasses are patchy with soil erosion being evident on some of the steeper slopes. Bush muhly was found almost always growing in association with creosote. In some instances creosote was dead or dying while the bush muhly was quite healthy. Bush muhly out competing the creosote has been observed in other creosote habitats in the District.

Reptiles

Transect #12. 30 May 1980 - Cnemidophorus inornatus (1.25/ha), Cnemidophorus tesselatus (1.875/ha), Crotaphytus collaris (1.875/ha).

C. inornatus seen were at the beginning of this transect and are not characteristic of this habitat type but are probably wanderers from Transect #10's habitat type which is just across the road. Much of this transect runs along high angle slopes of several Questas; C. tesselatus encountered were on low-angle slopes, otherwise this is perfect habitat for this species. C. collaris occurred throughout this habitat.

TABLE 12
MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #12 Date Trapped	Specie	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
13-14 May 1980	Dipodomys merriami	8	8		
13-14 May 1980	Peromyscus truei	4	4		
13-15 May 1980	Peromyscus eremicus	7	7		
13 May 1980	Onychomys torridus	3	3		
14 May 1980	Neotoma albigula	1	1		
14 May 1980	Perognathus intermedius	1	1		
14-15 May 1980	Peromyscus leucopus	3	3		
14 May 1980	Reithrodontomys megalogotis	1	1		
14-15 May 1980	Perognathus flavus	2	2		
2-3 December 1980	Neotoma albigula			4	4
2 December 1980	Peromyscus boylii			5	5
3 December 1980	Onychomys torridus			2	2
3-4 December 1980	Dipodomys merriami			2	2
2-3 December 1980	Peromyscus truei			2	2

*Density = Mammals/360 trap nights

TABLE 13

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

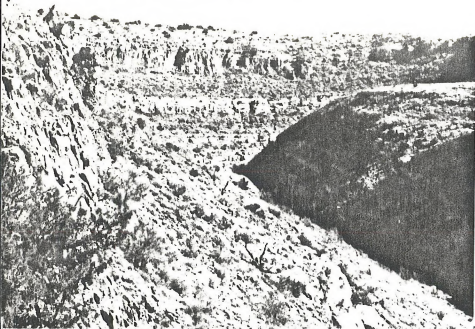
Transect #12					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Creosote	43/100m ²		.51	.26	
Tridens Puchellus	5.3/m ²	35	1.34		
Hilaria jamesii	3.0/m ²	6	1.25		
Sclereropogon brevifolius	5.1/m ²	10	.95		
Sclereropogon brevifolius	9.4/m ²	32	.8		
Bouteloua barbata	.2/m ²	3	.08		
Hoffmansigia	.2/m ²	3	.08		
Larrea tridentata	.6/m ²	13	5.45		
Sasola kali	.1/m ²	1	.03		
Tidestromia lanucinoso	.2/m ²	2	.05		
Succulent	.4/m ²	1	.03		
Euforbia sp.	1.1/m ²	10	.25		
Phacelia corrugata	3.0/m ²	6	.15		
Paresia	1.2/m ²	7	.3		
Annual forb		30	.75		
Xanthocephalum sarothrae	2.2/m ²	23	3.73		
Bouteloua eriopoda	21.9/m ²	45	7.58		
Bush muhly	.6/m ²	3	1.6		
Happlopappus spinulosus	.1/m ²	1	.03		

TABLE 13 (continued)

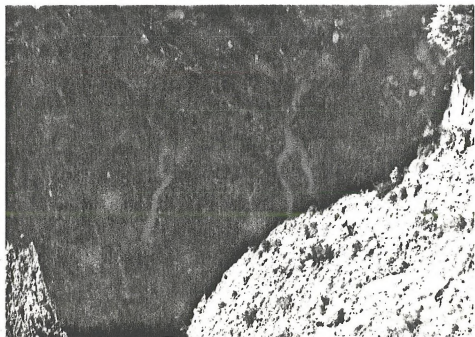
VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

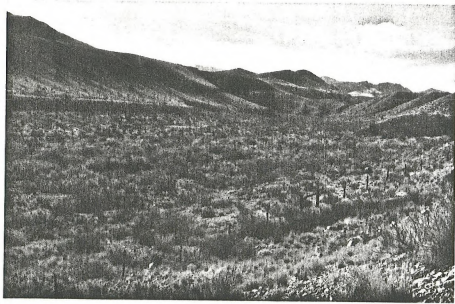
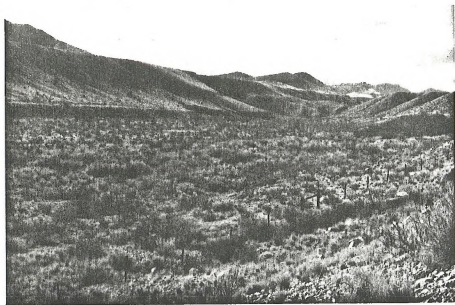
Transect #12					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Sporobolus contractus		2	.05		
Bahia pedata	1.5/m ²	6	.98		
Vulpia octoflora	.6/m ²	5	.13		
Eriogonum aberti	.2/m ²	3	.08		
Happlopappus spinulosus	.1/m ²	1	.15		
Unknown		1	.03		
Bouteloua gracilis	3.5/m ²	4	.83		
Hibiscusde	.1/m ²	1	.15		
Tridens PI	.1/m ²	1	.03		
Boutelus Cu	.1/m ²	1	.03		
Unknown		1	.03		
Sporobolus cryptandrus	.1/m ²	1	.03		
Euforbia spp.	.1	1	.03		
Unknown	.1	1	.03		



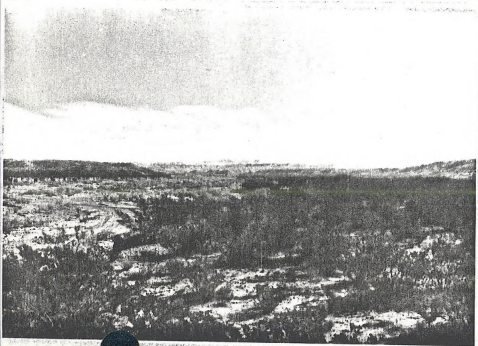


All Pictures Canoncito De la Uva





Upper Left	Nogal Canyon South
Upper Right	Madera Canyon Transect #6
Lower Left	Nogal Canyon South



Arroyo De las Canas Transect #2



Upper Left

Molino Canyon

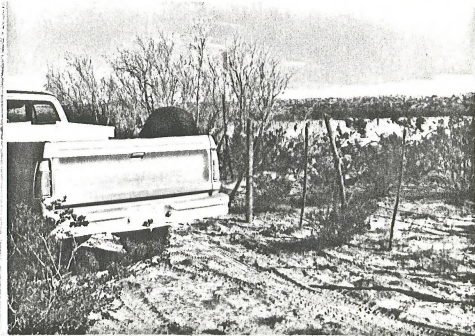
Lower Left

Madera Canyon

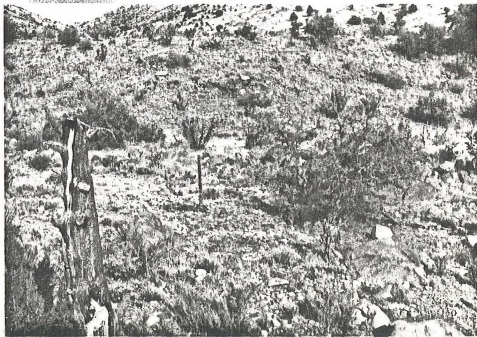
Lower Right

Transect #2

Begins 300 meters east of
Transect Pole in the middle
of the arroyo



Upper Left Transect #6 Beginning
Upper Right Madera Canyon
Lower Left Madera Canyon Transect #6





STANDARD HABITAT SITE #2

Pseudoriparian - three habitat sites: desert willow/brickdellia, 973 acres; apache-plume/Rhus, 14,657 acres ; Juniper/Creosote 320 acres, Total 15,950 acres.

The major Pseudoriparian habitats in the study area are along the east and west side of the Rio Grande. These arroyos flood periodically depending on thunderstorms during the rainy season. When they do flood the flow is strong enough to wash out trees, erode banks, and cover everything with silt and gravel. Henceforth most of the arroyo bottoms are sparsly vegetated but sometimes thickly vegetated along the edges with rhus, Apache-plume, creosote and desert willow. The edges of the arroyos are where most of the wildlife occur. It is generally a narrow belt as small as a few meters wide up to 50 meters wide. On the outside of the arroyos is creosote habitat and some wildlife move back and forth from the creosote to the narrow belt and into the arroyo bottoms. The arroyos range in size from 10 miles long and 200 meters wide to a couple of miles long and no more than 50 meters wide. Depending upon soil types and sizes, some of the banks in the arroyos range from several feet to 50 feet. Most of the arroyos run in an east-west direction.

STANDARD HABITAT SITE #3

Pseudoriparian - Two habitat sites - oak/alligator juniper, 1,420 acres;
rhys/Apache-plume, 12,033 acres. Total acres = 13,453.

The canyons for the most part are located on the east side of the Magdalenas. When the canyons are adjacent to the Forest Service, the bottoms are covered with large boulders with steeply sloping sides rising several hundred feet. As the canyons flow toward the Rio Grande the canyon walls get lower and the vegetation changes from oak, alligator juniper in the upper elevations to Apache-plume, rhys in the lower elevations. The edges of the canyons have pinyon on the north-facing slopes and yucca, Mountain mahogany, snakeweed, grasses on the south-facing slopes. Wildlife are not endemic to the arroyo bottoms but for the most part move back and forth from the bottoms to the sides. Good cover is offered in the canyon bottoms for wildlife with the edge between the bottoms and sides getting a lot of use by non-game species.

Birds

There are many pseudoriparian habitats in the study area. This includes a number of major arroyos which flows into the Rio Grande. All these arroyos are part of the Rio Grande drainage system and many riparian birds found in the riparian areas of the river filter up these arroyos. Bird diversity for the most part is good with a mixture of riparian, desert shrub, and upland birds. The farther you go away from the river the riparian birds thin out and the higher in elevation the desert shrub birds thin out leaving the higher upland birds. Elevation ranges from 4,600 feet along the river to 6,400 feet in the arroyos radiating out from the Magdalenas.

When Transect #2 was run (Table 14), one migrating specie was observed: the green-tailed towhee. In Arroyo de Las Canas, where Transect #2 was run, many birds were using the edge of the arroyo where the arroyo bottom plants merged with creosote habitat. The arroyo bottoms for the most part are mostly bare ground with a sandy gravel, rock bottom; so, the creosote along the sides provides the cover and nesting habitat. Desert willow and tamarisk are scattered along the arroyos providing nesting habitat for tree dwelling birds. Birds such as the northern oriole are probably nesting along the river in cottonwoods, and foraging up the arroyos for food. Bank swallows were found nesting in burrows dug out in soft soil along the banks of the arroyos. A great horned owl nest with two nestlings in it was found about 20 feet up a cliff face off Transect #2. Probable breeding, non-breeding and birds seen flying over Transect #2 is listed in Table 15.

Transect #6 (Table 20) was run in Madera Canyon adjacent to Forest Service land in the Magdalenas. Bird diversity was high with a mixture of birds found in pseudoriparian habitats, desert shrub and pinyon-juniper, ponderosa pine communities. Bird species was so diverse that this area could be called a heterogeneous habitat. However, birds were only counted in the arroyo bottoms and sides; but this probably could be considered an edge between the arroyo or canyon bottom and pinyon juniper forest on top. Even so, bird numbers are typical of this type of an area which is the reason the transect was placed in this canyon. Some birds from the ponderosa forest were present during the winter along the transect and absent during the summer. The canyon bottom had a good gray oak density which provided excellent breeding habitat for birds such as the plains titmouse, rufous-sided towhee, rufous-crowned sparrow, black-chinned sparrow, dark-eyed junco, and robin. The black-chinned sparrow, scrub jay, white-breasted nuthatch, common bushtit are more pinyon-juniper woodland birds and might be using the canyon bottom for foraging only. Breeding, probable breeding and birds seen flying over Transect #6 are listed in Table 21.

Mammals

Mammals found in the lower elevation arroyos within several miles of the Rio Grande were mostly dipodomys ordii, dipodomys merriami and onychomys leucaster. Most of the dipodomys colonies were adjacent to the arroyo just out of the major floodplains. The summer of 1980 had several thunderstorms that caused gully washes, any mammal living in the arroyo bottoms would have perished. Most small mammals are living along the edges and forage in the bottoms. Diversity is low due to lack of cover and food (Table 16).

Transect #6 was in Madera Canyon at an elevation of 6,400 feet. Common mammals were Eutamias dorsalis, Peromyscus boylii and Neotoma albugila (Table 22). Peromyscus boylii in New Mexico is considered an oak mouse. Its typical habitat is a warm rocky hillside with stands of oak and shrubs (Findley et al 1975). Eutamias dorsalis and Neotoma albigula like arroyos that have rock sides and good canopy cover with oaks and alligator juniper. Eutamias dorsalis would not be found in the lower elevation arroyos and is only found in typical habitats such as Transect #6 was run in.

These arroyo bottoms could be considered crucial areas for mule deer. In areas along the river the arroyos provide food and cover when the surrounding habitat is creosote. Arroyos such as Arroyo de Las Canas, Arroyo de Los Pinos, and Arroyo Tinajas have permanent water in them and any deer in the area will be found within several miles of these arroyos. Deer populations are low in the arroyos along the river and could support more deer if habitat conditions were better.

Madera Canyon and other canyons along the eastern edge of the Magdalena could be considered as excellent deer habitat when compared with the rest of the study area. Mountain mahogany is dense on some canyon sides with rhus and forb specie being common. Deer herds have been observed numbering as high as eighteen. However, this area has very high hunter use during deer season and deer taken out of these canyons may be high. This area is the only place in the study area where deer numbers could be considered good. All other parts of the study area have low to medium deer numbers. There is probably a little overlap of deer and pronghorn habitat at the mouths of the canyons on the east side of the Magdalenas. Pronghorn have been observed in areas where deer have been observed also.

Vegetation

Vegetation diversity and canopy cover is low in the arroyos off the river (Tables 17 and 18). Mammal densities reflect the low vegetation densities, but bird densities are good. This is probably due to the mobility of birds and the birds utilizing more than one habitat. Brickdellia had the highest density and canopy cover along the arroyo bottoms with creosote being high along the edges.

As previously mentioned many of these arroyos are subjected to periodic flooding and vegetation such as grasses and forbs can be scoured out from floods, leaving a gravel, sandy, rocky bottom with little cover. Brickdellia and desert willow appear unaffected from the periodic floods.

Madera Canyon and other canyons reflect a different type of habitat when looking at the vegetation. Diversity is good with nine different grasses, twenty different forbs and six browse plants, found along Transect #6 (Table 19). Vegetation on the south-facing slopes are grasses and pinyon juniper with grasses and browse plants on the rockier north-facing sides. Blue grama is the most common grass specie with gray oak providing the most canopy cover along the canyon bottoms.

Livestock grazing is higher on the sides and bottoms of the canyons, because cattle appear to use the shade in the canyon bottoms during the day in the summer, and use the canyon bottoms for shelter during the winter. Competition is probably high with cattle on the lesser sloped canyon sides and the bottoms. The steeper and rockier sides probably have less livestock use and more deer use.

TABLE 14

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #2		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
16-18 Dec. 1980	Sage Sparrow				115	.180	639
16-17 Dec. 1980	Finch sp.				8	.188	19
16-18 Dec. 1980	Ruby-Crowned kinglet				8	.250	30
29-30 April 1980	Rock Wren	20	.222	90	5	.250	20
1 May 1980							
16-17 Dec. 1980							
16 Dec. 1980	Robin				5	.50	10
17 Dec. 1980	White-crowned Sparrow				8	.125	60
17 Dec. 1980	Dark-eyed Junco				5	.167	30
29-30 April 1980	Loggerhead Shrike	13	.500	25	3	.500	5
1 May 1980							
18 Dec. 1980							
18 Dec. 1980	Crissal Thrasher				5	.167	30
29-30 April 1 May 1980	Black-throated Sparrow	198	.239	826			

TABLE 14 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #2		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
29-30 April 1980	Lark Bunting	23	.100	225			
29-30 April 1980 1 May 1980*	Great-horned Owl						
30 April 1980 1 May 1980	Ash-throated Flycatcher	23	.214	105			
1 May 1980	Brewer's Sparrow	23	.141	160			
29-30 April 1980 1 May 1980	Bank Swallow	15	.250	60			
29-30 April 1980 1 May 1980	Say's Phoebe	10	.250	40			
30 April 1980	Brown Towhee	8	.250	30			
30 April 1980	Green-Tailed Towhee	5	.250	20			
30 April 1980	Northern Oriole	5	.167	30			
1 May 1980	Chipping Sparrow	5	.167	30			
30 April 1980	Common nighthawk	3	.100	30			
1 May 1980	Sparrow sp.	3	.167	15			

TABLE 14 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #2		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
30 April 1980	Mockingbird	3	.167	15			
30 April 1980	Hummingbird sp.	3	.125	20			
29-30 April 1980	Lesser Nighthawk	3	.100	25			
29-30 April 1980	Mourning Dove	3	.500	5			
29 April 1980	Cassin's kingbird	3	.167	15			

* Great-horned Owl was nesting in cliff 50 meters from transect line. One adult female and two nestlings were present in nest of three days transect was run.

TABLE 15

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB),
AND BIRDS SEEN FLYING OVER TRANSECT #2

Finch sp.	3 observed flying over 16 December 1980, 3 observed flying over 18 December 1980.
Common Raven	1 observed flying over 18 December 1980.
Mourning Dove	2 observed flying over 29 April 1980, 4 observed 30 April, 1 observed 1 May.
Bank Swallow	7 observed flying over 29 April 1980, 1 observed 30 April, 3 observed 1 May.
Black-Throated Sparrow	1 observed flying over 30 April 1980,
Sage Sparrow	NB observed winter only
Finch sp.	NB observed winter only
Ruby-crowned kinglet	NB observed winter only
Rock Wren	B
Robin	NB observed winter only
White-Crowned Sparrow	NB observed winter only
Dark-Eyed Junco	NB observed winter only
Loggerhead Shrike	B
Crissal Thrasher	PB
Black-Throated Sparrow	B
Lark Bunting	PB
Great-Horned Owl	B nest observed with two young
Ash-Throated Flycatcher	PB
Brewer's Sparrow	PB
Bank Swallow	B
Say's Phoebe	PB
Brown Phoebe	PB
Green-Tailed Towhee	NB observed during migration

TABLE 15 (continued)

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB),
AND BIRDS SEEN FLYING OVER TRANSECT #2

Northern Oriole	NB
Chipping Sparrow	PB
Common Nighthawk	PB
Mockingbird	PB
Hummingbird sp.	PB
Lesser Nighthawk	PB
Mourning Dove	PB
Cassin's Kingbird	PB

TABLE 16

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #2					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
29 April 1980	Dipodomys merriami	3			
30 April 1980	Dipodomys merriami	3			
30 April 1980	Rethrodontomys megalotis	1			
1 May 1980	Dipodomys merriami	3			
17 December 1980	Dipodomys ordii			2	
17 December 1980	Dipodomys merriami			5	
17 December 1980	Onychomys torridus			1	
18 December 1980	Dipodomys Ordii			2	
	Dipodomys merriami		9		
	Rethrodontomys megalotis		1		
	Dipodomys Ordii				4
	Dipodomys merriami				5
	Onychomys torridus				1

* Density = Mammals/360 trap nights

Reptiles

Transect #2. 18 June 1980 - Cnemidophorus tigris (3.75/ha), Cnemidophorus tessellatus (.625/ha), Gambelia wislizenii (.625/ha), Urosaurus ornatus (.625/ha), Unidentified (.625/ha).

The majority of this transect-traversed terrain is inhospitable to lizards, reptiles and amphibians. There was virtually no cover and the surface of the arroyo was hard-baked clay, which precluded the occurrence of species that might otherwise be expected in similar habitat, such as Uta and Holbrookia. Half of the lizards encountered were at the extreme upper end of the transect, where it entered sandy-gravelly soil and cover plants such as Felugia and Rhus became abundant. Other lizards were seen in association with desert willow hammocks on the arroyo floor. Cnemidophorus tigris was the most abundant species but would not be considered a resident of this type of habitat. Individuals were traversing the arroyo between areas of creosotebush, although some may have been utilizing burrows in the arroyo walls for shelter.

Reptiles

Transect #6. 19 June 1980 - Cnemidophorus exsanguis (1.25/ha), Cnemidophorus tesselatus (.625/ha), Cnemidophorus uniparens (1.25/ha), Holbrookia (Cophosaurus) texana (1.875/ha), Sceloporus poinsetti (1.875/ha), Urosaurus ornatus (.625/ha). Holbrookia (Cophosaurus) texana was seen only at the beginning of the transect, where Madera Canyon opens and transits from predominantly montane-riparian to more of a desert-wash type of situation. Urosaurus and Sceloporus were both more abundant; than density figures indicate; individuals of both species were easy to overlook because of the portion of the habitat they utilize (boulders, trees, etc.). All three species of Cnemidophorus were encountered on the canyon floor and all three are parthenogenetic, which makes this an intriguing area to study this phenomenon and the interactions of these species. This is considered an ideal habitat for C. exsanguis, perhaps suitable for C. tesselatus as well.

TABLE 17

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #2A					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Brickdellia	2.0	14	2.05		
Unknown spp.	.2	2	.05		
Sporobulus flexuosus	.2	2	.05		
Baileya multiradiata	.1	1	.15		
Desert Willow	.1	2	1.83		
Sideoats grama	.1	1	.03		
Xanthocephalum sarthrae	.2	2	.05		
Lesquerella	.1	1	.03		
Fluff grass	1.3	5	.13		
Three-awn	.1	1	.03		
Burro grass	.2	1	.03		
Large rock		11	2.65		
Small rock		75	41.13		
Litter		17	1.05		
Bare ground		90	33.78		

TABLE 18

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #2B					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Chamaesaracha sordia	5.19	64	2.15		
Xanthocephalum sarrothrae	.06	5	.75		
Cryptantha sp.	1.42	36	1.4		
Phacelia corrugata	.07	5	.13		
Dithyrega wislizenii	.22	18	.45		
Astragalus spp.	.02	2	.05		
Euphorb spp.	.07	5	.30		
Bouteloua barbata	.07	4	.10		
Fluff grass	.10	8	.23		
Prosopis	.03	3	3.08		
Bush muhly	.02	2	.53		
Wolly paperflower	.05	3	.08		
Lemonweed	.01	1	.03		
Pectis papposa	.1	10	.25		
Sasola kali	.01	1	.03		
Gaura coccinea	.02	1	.03		
Sand Dropseed	.02	1	.15		
Brickdellia	12/100m ²		.458	.03	
Desert Willow	1/100m ²		1.7	4.14	
Apache-plume	1/100m ²		.05	.08	
Creosote	9/100m ²		2.13	.20	

TABLE 18 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #2B					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Bare ground		96	56.38		
Litter		94	19.75		
Gravel		65	2.88		

TABLE 19

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #6					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Bouteloua gracilis	10.35	27	3.980		
Eriogonum wrightii	1.55	14	1.300		
Dalia	.35	3	.075		
Tridens puchella	.10	1	.025		
Sideoats grama	9.50	49	5.150		
Sand dropseed	.65	6	.275		
Amaranthus torrey	.75	3	.075		
Euforbia spp.	.45	2	.175		
Unknown spp.	.20	4	.100		
Squirreltail	1.10	9	.600		
Muhlenbergia porteri	.35	2	.300		
Opuntia spp.	.05	2	1.000		
Gray oak	30 ha	13	6.950		
Artemisia dracunculoides		1	.025		
Snakeweed	.20	6	1.000		
Deadly nightshade	.25	2	.050		
Lycium	.15	2	.175		
Unknown spp.	.10	4	1.900		
Hasp	.10	3	.325		
Wolftail	.90	8	.575		
Sphaeraicea	.05	1	.025		
Viguiera cordifolia	.15	5	.375		
Spicebush		1	.150		
Jude	11 ha	9	4.320		
Unknown spp.	1.75	8	.325		
Three-awn spp.	.30	2	.050		
Brickellia californica		1	.025		
Artemisia philifolia	.45	6	.275		
Erigeron nudiflorus	.15	2	.050		
Thistle spp.	.05	1	.025		
Gilia multiflora	.25	5	.250		
Artemisia ludoviciana	1.00	4	.100		
Apache-plume	.50	6	3.230		
Bahia dissecta	.05	1	.025		
Lotus neomexicanus	.70	6	.400		
Bouteloua eriopoda	.05	1	.150		
Bromus fringdasus	.75	3	.325		
Cholla		2	.175		
Bothriochloa barbinodis	.05	1	.025		
Cercocarpa		1	.975		

TABLE 19 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #6					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Eriogonum abertianum	.10	1	.025		
Hedgehog cactus spp.	.05	1	.025		
Globemallow	.05	1	.025		
Ipomoea spp.	.10	1	.025		
Unknown spp.	.25	2	.175		
Physalis	.05	1	.025		
Leptochloa	.80	2	.175		
Sphaea spp.	.20	2	.400		
Bahia dissecta	.05	1	.025		
Large rock		62	20.150		
Small rock		76	39.000		
Litter		87	15.700		
Bare ground		26	3.080		

TABLE 20

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #6	Date	Species	Summer		Winter		
			Observed Density ² (Birds)km ²	CD	Estimated Density ² (Birds)km ²	Observed Density ² (Birds)km ²	Estimated Density ² (Birds)km ²
	10-12 June 1980	Mockingbird	53	.202	260		
	10-12 June 1980	Rufous-Sided Towhee	45	.257	175		
	10-12 June 1980	Bewick's Wren	45	.173	260		
	10-12 June 1980	House Finch	35	.159	220		
	10-12 June 1980 6-8 Jan. 1981	Rock Wren	30	.167	180	13	.250 50
	10-12 June 1980	Chipping Sparrow	25	.250	100		
	11-12 June 1980	Rufous-Crowned Sparrow	25	.200	125		
	10-12 June 1980	Ash-Throated Flycatcher	25	.208	120		
	10-12 June 1980 6-8 Jan. 1981	Plain's Titmouse	23	.141	160	8	.150 50
	10-12 June 1980	Yellow-Rumped Warbler	20	.167	120		
	10-12 June 1980 6-8 Jan. 1981	Canyon Wren	20	.267	75	5	.250 20
	10-12 June 1980	Black-Chinned Sparrow	18	.175	100		

TABLE 20 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #6		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
10-12 June 1980	Western Kingbird	18	.250	70			
10-12 June 1980	Brown Towhee	15	.12	125	53	.250	210
6-8 Jan. 1981							
10-12 June 1980	Black-Headed Grosbeak	13	.167	75			
10-12 June 1980	Scrub Jay	10	.200	50	13	.417	30
7-8 Jan. 1981							
10-12 June 1980	Dark-Eyed Junco	10	.200	50	513	.184	2,785
6-8 Jan. 1981							
10-12 June 1980	Scott's Oriole	10	.222	45			
11-12 June 1980	Common Bushtit	8	.125	60	83	.165	500
6-8 Jan. 1981							
10-12 June 1980	Robin	8	.150	50	45	.250	180
10-11 June 1980	Grace's Warbler	3	.125	20			
10-11 June 1980	Hummingbird sp.	3	.167	15			
10 June 1980	Cooper Hawk	3	.1	25			

TABLE 20 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #6		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
10-11 June 1980	White-Breasted nuthatch	3	.250	10			
10 June 1980	Crissal Thrasher	3	.100	30			
11 June 1980 7 Jan. 1981	Ladder-backed Woodpecker	3	.125	20	3	.50	5
12 June 1980	Gray Vireo	3	.100	25			
12 June 1980	Flycatcher Spp.	3	.167	15			
6-8 Jan. 1981	Mountain Bluebird				48	.475	100
7 Jan. 1981	Yellow-Bellied Sapsucker				3	.125	20
6-8 Jan. 1981	Common Flicker				8	.250	80
7-8 Jan. 1981	Ruby-Crowned Kinglet				5	.125	40
8 Jan. 1981	Western Bluebird				15	.125	120

TABLE 21

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS,
AND BIRDS SEEN FLYING OVER TRANSECT #2

Mountain Bluebird	1 observed flying over 1 January 1981
Mockingbird	PB
Rufous-Sided Towhee	B
Bewick's Wren	PB
House Finch	B
Rock Wren	B
Chipping Sparrow	PB
Rufous-Crowned Sparrow	PB
Ash-Throated Flycatcher	B
Plain's Titmouse	B
Yellow-Rumped Warbler	PB
Canyon Wren	B
Black-Chinned Sparrow	PB
Western Kingbird	PB
Brown Towhee	B
Black-Headed Grosbeak	B
Scrub Jay	PB
Dark-Eyed Junco	PB
Scott's Oriole	PB
Common Bushtit	PB
American Robin	PB
Grace's Warbler	PB
Hummingbird spp.	PB

TABLE 21 (continued)

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS,
AND BIRDS SEEN FLYING OVER TRANSECT #2

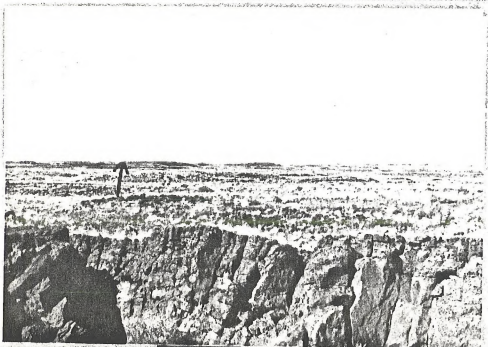
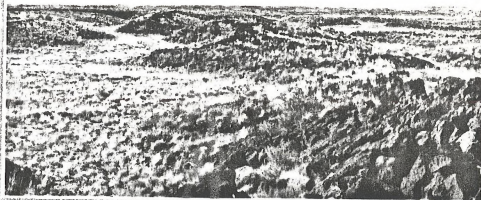
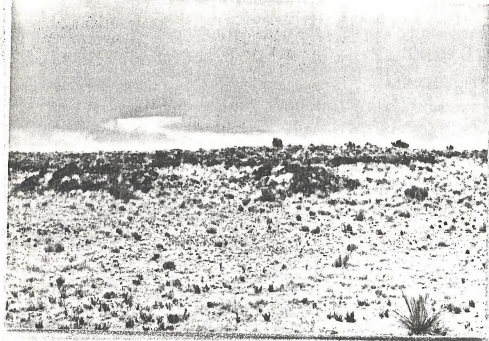
Cooper's Hawk	PB
White-Breasted Nuthatch	PB
Crissal Thrasher	PB
Ladder-backed Woodpecker	PB
Gray Vireo	PB
Flycatcher spp.	B
Mountain Bluebird	NB observed winter only
Yellow-Bellied Sapsucker	NB observed winter only
Common Flicker	PB
Ruby Crowned Kinglet	NB observed winter only
Western Bluebird	NB observed winter only

TABLE 22

MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #6		Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
Date Trapped	Specie				
11-12 June 1980	Eutamias dorsalis	3	3		
11-12 June 1980	Peromyscus boylii	3	3		
6-7-8 Jan. 1981	Peromyscus boylii			7	7
6-7 Jan. 1981	Neotoma albigula			4	4

* Density = Mammals/360 trapnights

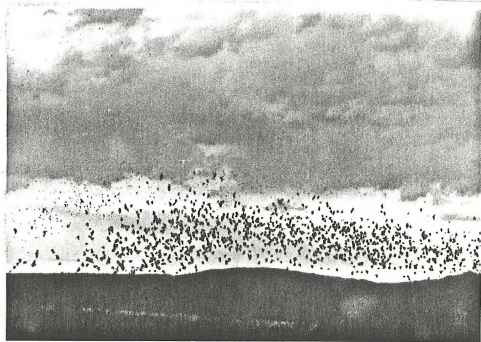
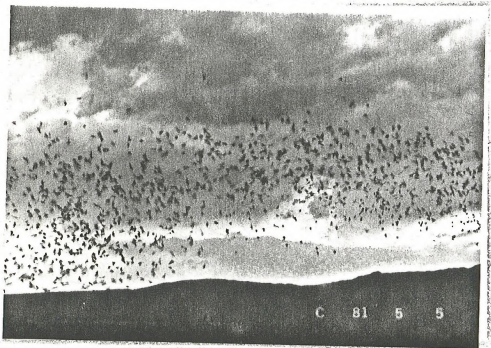


Upper Right

Typical Jornada Lava Flow

Lower Left

Transect #5 Direction towards
the south end of San Mateo Peak



STANDARD HABITAT SITE #4

Malpais or Lava - two habitat sites - Tobosa/Snakeweed 16,896 acres;
Black grama/Snakeweed 8,678 acres; total acres 25,574.

The Malpais in this study area appear to be older flows than the large flows near Grants. Vegetation is for the most part well established and the flows are worn down by erosion giving it more of a rolling hill appearance. Exposed ridges are separated by small and large kipukas that are covered in thick stands of tobosa. The wildlife is widely spread throughout the flows and can be found from the edges of the flows toward the middle. Craters and lava tubes are found in the flow, but, all known ones are located on private land. The lava tubes in the Jornada Del Muerto flow are 50 to 70 feet deep and several miles long. There is no water in the flow except for a few miles of pipeline near the Harriet Ranch and several windmills located on private land southwest of the Harriet Ranch.

Birds

Inside the lava flow bird density appeared highest along the edges of kipukas. These kipukas have good stands of grasses and are also where yuccas and shrubs grow. The shrubs grow densely in places where the lava meets the kipukas, making a good habitat for breeding birds (Table 23). Where vegetation is less and bare lava more exposed, bird density is lower.

When Transect #5 was run in early May 1980, yellow-rumped warblers and hermit thrushes were observed. These birds were obviously migrating due to the unsuitable breeding habitat. The Jornada lava flow is a large area that the Rio Grande flows around. As birds migrate up the Rio Grande they may fly across the lava field following a shorter, straighter course that requires less energy. The lava field could be a migration route for some species of birds, but presently there is not enough data to support this idea. Breeding, probable breeding and birds seen flying over Transect #5 are listed in Table 24.

Mockingbirds, Scott's oriole and kingbird species apparently need very little shrubs or taller yuccas to nest in. This is evident due to the lack of such vegetation. Wherever a tall yucca stood it was either used as a perch by raptors, perching birds or for nest building in them. Lark buntings and horned lark were the most common birds during the breeding season. These birds breed in short-grass prairies, and the lava flow could be considered as a grassland habitat. Twelve types of grasses, twenty-two forbs and four shrub species were found along Transect #5. Grasses made up the largest density with tobosa, blue grama and black grama being the most common (Table 26).

Mammals

Mammal density was the highest found in any part of the study area (Table 25). Eight small mammals were trapped along the transect line. Peromyscus boylii, Pereomyscus eremicus, Peromyscus leucopus, and Neotoma albigula were all melanistic in coloration. This has been observed in other lava flows such as the flow near Carrizozo. Ord's kangaroo rats were trapped also but lacked the dark coloration. The lava flow provides good protection, breeding habitat and food for small mammals.

Larger mammals found in the area were coyotes and pronghorn. The Jornada lava flow has the highest number of Pronghorn of any place in the District with up to 100 being observed in one herd. Pronghorn kidding grounds have been identified by the survey to occur in kipukas within three miles of any water source. Water is scarce in the lava flow; there are only about eight water sources and these are mostly along the edge.

To identify kidding grounds one should draw a 3-mile circle around the water sources and identify all kipukas within the circle. The kipukas have a dense growth of tobosa, black grama, sand dropseed, six-week three-awn, globemallow and eight other forbs. The tobosa and sand dropseed grow tall enough to easily hide a small pronghorn kid and the food available is high enough for the females to probably not have to travel too far in search of food. The kipukas range in size from several feet across to several hundred yards. Several wildlife waters placed in the lava flow would definitely benefit wildlife. Parts of the lava flow may have never been grazed by livestock making the lava flow a relic area for vegetation.

The bat caves which are within one and three-quarters miles of the BLM wilderness study area NM-020-055 are the most significant find in the District in the stand point of wildlife. This bat cave is considered to be one of the top three roosts of Brazilian free-tailed bats in the United States. Population numbers range from 300,000 to upwards of 2 million bats in these lava tubes. The Oppenheimer Industries Incorporated owns the lands and has expressed interest in selling the land. The significance of this population cannot be emphasized enough and protection of these caves from development and recreation should be a high priority.

The population of bats in this cave system is higher than the population in Carlsbad Caverns (Buz Hummel pers. comm.). People from Carlsbad and Buz Hummel from the Roswell District want to set up survey equipment and do studies on the bat population starting in the spring of 1981. Another important factor of this cave system is its remoteness. Most major roosts in the United States are well known and either protected through Government Agencies or private organizations or they are abused by the general public. A lot of unprotected roosts have been vandalized or been greatly disturbed. This roost is virtually unknown by the general public and has not been disturbed in perhaps forty-eight years. This cave system is ideal for scientific research and should remain undisturbed. If the land can be acquired, it should be closed off from the general public with absolutely no recreation taking place in the area.

TABLE 23

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #5		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
7-9 May 1980	Horned Lark	128	.199	641	245	.355	690
9-11 Dec. 1980							
9 May 1980	Scaled Quail	18	.125	140	105	.260	404
9-11 Dec. 1980							
9-11 Dec. 1980	Sage Sparrow				53	.175	300
9-11 Dec. 1980	Western Meadowlark				30	.182	165
7-9 May 1980	Rock Wren	18	.125	140	10	.250	40
9-11 Dec. 1980							
9-11 Dec. 1980	Canyon Wren				10	.167	60
9-11 Dec. 1980	Marsh Hawk				3	.100	25
10 Dec. 1980	Roadrunner				3	.250	10
7-9 May 1980	Lark Bunting	213	.193	1,101			
7 May 1980	Black-Throated Sparrow	56	.192	300			
7-9 May 1980	Kingbird Spp.	25	.167	150			

TABLE 23 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #5		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
7-9 May 1980	Mockingbird	13	.208	60			
8-9 May 1980	Scott's Oriole	8	.150	50			
7 May 1980	Yellow-Rumped Warbler	5	.100	50			
8 May 1980	Hermit Thrush	5	.125	40			
8 May 1980	Brown Towhee	3	.125	20			

TABLE 24

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS,
AND BIRDS OBSERVED FLYING OVER TRANSECT #5

Horned Lark	1 observed flying over Transect 9 December 1980, 5 the 11th of Dec., 37 the 10th
Rock Wren	2 observed flying over Transect 11 December 1980
Western Meadowlark	4 observed flying over transect 11 December 1980
Horned Lark	B
Scaled Quail	B
Sage Sparrow	NB observed winter only
Western Meadowlark	PB
Rock Wren	B
Canyon Wren	NB observed winter only
Marsh Hawk	NB observed winter only
Roadrunner	PB observed winter only
Lark Bunting	PB
Black-Throated Sparrow	B
Kingbird Spp.	PB
Mockingbird	PB
Scott's Oriole	B
Yellow-Rumped Warbler	NB observed migrating
Hermit Thrush	NB observed migrating
Brown Towhee	B

TABLE 25
MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #5		Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
Date Trapped	Specie				
15-16-17 April 80	Peromyscus leucopus	7	7		
15-16-17 April 80	Dipodomys ordii	1	1		
15-16-17 April 80	Neotoma albigula	1	1		
16-17 April 80	Perognathus flavus	2	2		
15-16-17 April 80	Peromyscus boylii	7	7		
16-17 April 80	Peromyscus eremicus	6	6		
17 April 1980	Onychomys leucogaster	1	1		
9-10-11 Dec. 80	Peromyscus eremicus			19	19
9-10 Dec. 80	Perognathus flavus			2	2
11 Dec. 80	Dipodomys spectabilis			1	1
11 Dec. 1980	Neotoma albigula			1	1

* Density = Mammal/360 trap nights

TABLE 26

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #5					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Verbena wrightii		1	.03		.03
Sporobolus cryptandrus	.1	1	.03		1.13
Chorizanthe rigida	1.2	2	.18		13.38
Portulaca spp.	1	4	.23		11.23
Sphaeralcea fendleri	.3	2	.05		3.35
Leptochba viscida	.6	2	.18		6.78
Bouteloua gracilis	1.8	5	.85		20.65
HISA	1.9	6	1.23		22.13
SONU	.4	1	.15		4.55
PAOB	2.8	6	1.33		32.13
Kuhnia chlorblepis	.1	1	1.48		2.58
Eragostis arida	2.0	5	.43		22.43
CRLA	.5	1	.15		5.65
Ephnora triperia	.3	3	1.95		5.25
Perezia nana	.1	1	.03		1.13
POPA	.3	2	.05		3.35
HODE	.4	4	.73		5.13
Sporobolus flexuosus	1.1	6	.53		12.63
Erigeron			.03		.03
Daliea spp.			.18		.18

TABLE 26 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #5					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Sporobolus airoides	1.7	10	2.33		21.03
ERCI	.2	2	.18		2.38
Yucca elata	.1	1	5.85		6.95
Sphaeralcea	.1	1	.03		1.13
Sporobolus contractus	.2	1	.03		2.23
Euse serphyllifolia	.1	1	.18		1.28
Atriplex canescens			.15		.15
HECI	2.1	7	1.38		24.48
Pooleracea	.3	2	.30		3.60
Tobosa	.3	2	.53		3.83
Tidestromia lanuginosa	.6	5	.25		6.85
Solinocarpus	.1	1	.03		1.13
PO Retusa	.1	1	.03		1.13
Tragus bertercnianus	.2	2	.05		2.25
Penstemon palmeri	1.0	9	.23		11.23
Pplygonum panctatum	.1	2	.05		1.15
Sclereropogon brevifolius	.4	1	.15		4.55
Enneapogon desbaxii	6.8	22	1.18		75.98
Allionia incarnata	.2	2	.05		2.25
Boutelous eriopoda	.7	3	.08		7.78

TABLE 26 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #5					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Euse Serrola	.5	4	.35		5.85
Cassia baubinodes	.2	4	.23		2.43
Xanthocephalum sarrothrae	.8	12	.14		8.94
Sasola kalia	2.7	20	1.38		31.08
Bouteloua eriopoda	3.0	12	3.20		36.20
Aristida adscensionis	1.6	11	.45		18.05
Bouteloua barbata	7.0	22	1.43		78.43
CRPU	2.3	16	.88		26.18
Aristida fendleriana	.2	2	.18		2.38
Large Rock		8	4.45		
Small Rock		28	16.65		
Litter		87	15.48		
Bare Ground		85	38.7		

Reptiles

Transect #5. 23 May 1980 - Cnemidophorus inornatus (5.625/ha), Cnemidophorus uniparens (1.875/ha), Crotaphytus collaris (1.875/ha), Sceloporus undulatus (.625/ha), Uta stansburiana (.625/ha). Phrynosoma cornutum collected, Masticophis flagellum observed.

This was one of the more unique habitat types. This appears to be a very old flow. Cnemidophorus inornatus, Sceloporus undulatus also P. cornutum and Uta stansburiana lizards typical of SHS #1 which surrounds the flow, occurred on the outer fringes of the flow where considerable amounts of sand have accumulated over the lava bedrock. Sceloporus undulatus, here again, appears to be restricted to the vicinity of yucca plants. Cnemidophorus uniparens abruptly replaces C. inornatus in the interior of the flow. This is interesting in view of the theorized ability of parthenogenetic species of Cnemidophorus to colonize disturbed or disclimax areas better than, and sometimes to the exclusion of, bisexual species (C. uniparens is parthenogenetic, C. inornatus is not). Crotaphytus collaris occurs throughout the flow; lizards appear almost completely black and blend in extremely well with the bare lava rock. This melanism is physiological, however, for individuals quickly return to normal coloration for this species when captured. A Masticophis flagellum observed during bat-netting activities appeared to be darker than usual, and Crotalus atrox occurring on this flow are apparently very melanistic, according to local rancher J. Mounyo.

STANDARD HABITAT SITE #5

Mixed Shrub Grass Hills - Six habitat sites - Xasa/prickly leaf dogweed, 1,493 acres; Xasa/sandsage, 15,667; Yucca/Galleta, 39,782; Sandsage/Galleta, 1,433; Sand dropseed wolfberry, 781; Rhus/Jumo, 1,741; Total acres - 60,897.

This is a fairly diverse SHS in the Jornada with habitat sites scattered throughout the study area. A lot of these sites are adjacent or between pinyon-juniper woodlands. The habitat sites offer little cover for most wildlife specie. Most shrubs are found in a sandier soil, on the north side of the hills or along small arroyos or gullies. Grasses are the principal ground cover with BOER and galleta being the most common.

Transect #15 was run in an area that may not best represent this habitat. Cover was excellent along the transect line with large clumps of Rhus and widely scattered juniper. Bird densities were good of all birds encountered (Table 27). The black-throated sparrow was the most abundant bird, with other birds encountered about equal in densities. Other mixed-shrub grass habitats had less cover and birds found in these areas were more closely related to a shrub pediment type of habitat. These two habitats could probably be lumped together due to animal species found; however, land form and vegetation are different and that is significant. Breeding, probable breeding and birds seen flying over the Transect are listed in Table 28.

Transect #15 had a mixture of tree-dwelling and shrub dwelling birds. The widely scattered junipers in the habitat contributed to birds such as the great horned owl and the western kingbird. A great horned owl nest was found along the transect nesting in an old raptor nest in a juniper. Mammal density is good, creating a good food source for predators.

Onychomys specie, Neotoma albigula, Peromyscus truei, Peromyscus maniculatus, Dipodomys ordii and Dipodomys merriami were the small mammals caught along transect #15 (Table 29). Other mammals observed were pronghorn, coyote, and badgers throughout the area. The area sampled is a small tract of land that is only 1,741 acres in size.

Grasslands are adjacent to the habitat so animals species are probably a little higher along the edge of the grasslands and the shrub habitat.

Vegetation is composed chiefly of large clumps of *Rhus*. These clumps range in size from several feet high and across to seven or eight feet high and twenty to thirty feet across. Soil is very sandy and erosion is high between the clumps of *rhus* creating isolated islands. Most small mammals and birds use the clumps for nesting and forage for food in the clumps and around them. Eight forbs and seven grasses were observed along transect 15 (Table 30). Sand dropseed was the most common grass, *Eriogonum wrightii* the most common forb and *Yucca* specie the most common shrub. Bare ground was 62 percent of the canopy cover so between the islands of *Rhus* cover is almost nonesistent.

TABLE 27

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #15		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
22-24 July 1980	Black-Throated Sparrow	137.5	.187	735			
22-24 July 1980 13-15 Jan. 1981	Cactus Wren	40	.250	160	20	.2	200
22-24 July 1980	House Finch	28	.204	135			
22-24 July 1980	Mockingbird	25	.208	120			
22-24 July 1980 13-15 Jan 1980	Crissal Thrasher	23	.141	160	15	.2	75
22-24 July 1980	Western Kingbird	20	.250	80			
22-24 July 1980	Common Nighthawk	13	.167	75			
22-24 July 1980 13-15 Jan. 1981	Brown Towhee	10	.200	50	10	.222	45
22-24 July 1980	Broad-Tailed Hummingbird	10	.125	80			
22-24 July 1980	Loggerhead Shrike	8	.189	40			
23 July 1980	Great-Horned Owl	5	.100	50			

TABLE 27 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #15		Summer		Winter	
Date	Species	Observed Density (Birds)km ²	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	Estimated Density (Birds)km ²
13-15 Jan. 1981	Sage Sparrow			93	.117
13-15 Jan. 1981	Dark-Eyed Junco			63	.125
14 Jan. 1981	Lesser Goldfinch			3	.250
14-15 Jan. 1981	Unknown Spp.			8	.500

TABLE 28

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS,
AND BIRDS OBSERVED FLYING OVER TRANSECT #15

Common Nighthawk	1 observed flying over transect 23 July 1980, 1 flew over 22 July
Hummingbird Spp.	1 observed flying over transect 22 July 1980
Black-Throated Sparrow	B
Cactus Wren	PB
House Finch	PB
Mockingbird	B
Crissal Thrasher	B
Western Kingbird	B
Common Nighthawk	PB
Brown Towhee	B
Broad-Tailed Hummingbird	PB
Loggerhead Shrike	PB
Great-Horned Owl	B
Sage Sparrow	NB observed winter only
Dark-Eyed Junco	NB observed winter only
Lesser Goldfinch	NB

TABLE 29

MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #15					
Date Trapped	Specie	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
10-11 Sept. 1980	Neotoma albigula	2	2		
10-11 Sept. 1980	Peromyscus truei	9	9		
10 Sept. 1980	Dipodomys ordii	1	1		
13-14 Jan. 1981	Onychomys leucogaster			2	2
13-14 Jan. 1981	Neotoma albigula			2	2
13 Jan. 1981	Dipodomys ordii			2	2
13 Jan. 1981	Dipodomys merriami			1	1
14 Jan. 1981	Peromyscus truei			1	1
14 January 1981	Peromyscus maniculatus			2	2

* Density = Mammals/360 trap nights

TABLE 30

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #15					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Sand Dropseed	1.2/m ²	16	.65		13.85
Ephedra	2.3/100m ²	5	1.43	.09	2.53
Wooly Paperflower	3/m ²	17	.43		33.43
Wooly Paperflower	1.6/m ²	10	.25		17.85
Wooly Paperflower	.2/m ²	2	.18		2.38
Linum aristatum	1.6/m ²	13	1.08		18.68
Eriogonum wrightii	6.4/m ²	27	.68		71.08
Yucca	5.7/100m ²	6	2.75	.30	6.05
Xanthocephalum sarrothrae	1.5/m ²	16	3.4		19.9
Sporablis giganteus	.5/m ²	4	.23		5.73
Four-wing Saltbush	.2/m ²	2	1.83	.09	4.03
Euforbia (rattlesnake)	.1/m ²	1	.15		1.25
Sandsage		5	.13		.13
Jumo	3.3/ha		19.34	5.80	
Rhus macrofilia	.99/100m ²		13.3	24.80	
Lemonweed	.2/m ²	2	.05		2.25
Aristida fendleriana	.2/m ²	2	.05		2.25
Hilaria jamesii	.4/m ²	1	.03		4.43
False Buffalograss	.5/m ²	4	.23		5.73
Senecio multicapitatus	.1/m ²	1	.15		1.25

TABLE 30 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #15					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
<i>Tridens pulchella</i>	.1/m ²	1	.03		1.13
<i>Euforbia</i> spp.	.2/m ²	1	.03		2.23
<i>Salsoia kali</i>	.1/m ²	1	.03		1.13
<i>Bouteloua barbata</i>	.1/m ²	1	.03		1.13
<i>Senecio multicapitatus</i>	.2/m ²	3	.55		2.75
Large rock		1	.03		
Small rock		30	2.10		
Litter		93	25.23		
Bare ground		93	62.20		

Reptiles

Transect #15. 30 July 1980 - Sceloporus undulatus (3.75/ha).

Terrapene ornata collected. Cnemidophorus inornatus, Sceloporus magister and Pituophis melanoleucus observed.

Hatching lizards were present at this time. The San Antonio-Bingham road-riding route passes for about 2.4 km through this habitat.

Other species that can be verified for this habitat are Scaphiopus bombifrons, Scaphiopus couchi, Arizona elegans, Gyalopion canum, Lampropeltis getulus, Rhinocheilus lecontei, Tantilla nigriceps, and Crotalus viridis.

STANDARD HABITAT SITE #6

Mesquite Rolling Upland

Habitat site - Mesquite/four-wing, 5,377; Mesquite/Xasa, 4,109; Xasa/Mesquite, 1,280; total acres 10,766.

This is a narrow band of vegetation that begins at the foothills heading east from the Rio Grande. It divides the riparian vegetation along the river from the creosote hills. The mesquite is often thick and tall making travel for a person on foot difficult. It provides good cover for many species, and a lot of this area appears to have not been grazed by livestock for a long time. This area is often very hot in the summer lacking the breezes one finds in the hills and the humidity from the river. A temperature reading of 115 degrees F. was taken last summer in July in this area. Ground cover is sparse and erosion is quite evident as some of the mesquite clumps are several feet higher than the surface in between. Along the Bosquecito Road there are several clumps that stand about 15 feet higher than the surrounding soil surface. The soil is a terrace deposit often quite sandy in places.

HABITAT SITE

Mesquite Sand Dune

Habitat Sites - Broom dalea/mesquite, 17,259; Galleta/mesquite, 2,790;
total acres 20,049.

This SHS is found east of and a few miles from the river on top of terraced slopes where terrain is flat; it is also found west of the Loma de Las Canas Mountains. Diversity is low with some of the area having devegetative dunes. It is unknown if these exposed dunes are active but the vegetative dunes are stabilized by vegetation. Most of the mesquite is found in clumps or small stands surrounded by broom dalea and other shrubs or half shrubs. These clumps stand usually 2 to 3 feet higher than the area around it, probably due to soil erosion.

HABITAT SITE

Mesquite Questa

Habitat Site - Boer/mesquite, 11,725; total acres 11,725.

These Questas are dry and open with small widely scattered clumps of mesquite. The mesquite offers the cover and this is where most non-game species occur. Grasses are widely dispersed throughout the study area. Creosote can be found in the habitat site but in smaller numbers than other parts of the District. Ground cover is sparse for the most part throughout this SHS. Black grama is the dominant grass occurring on north-facing slopes in dense mats in some places. The south-facing slopes lack ground cover and it is in this area that creosote occasionally occurs.

Most mesquite habitats are located near the river. As the land starts rising from the river particularly on the east side of the river, mesquite is the first vegetative zone once the riparian areas of cottonwoods and salt cedar are left behind. Bird composition is low in these types of habitats usually because of a lack of food. Black-throated sparrows was the most common breeding bird and sage sparrow the most common wintering bird (Table 31). Mockingbirds are also abundant in this type of habitat during the breeding season. When mesquite is close to the river and adjacent to the riparian trees many birds found in the riparian environment forage for food in the mesquite habitat. Birds observed foraging were phainopepla, northern oriole, Gambel's quail, lesser goldfinch, violet-green swallow, and yellow-rumped warbler. Breeding, probable breeding and birds observed flying over Transect #3 is listed in Table 32.

Dipodomys ordii was the most common small mammal snap-trapped along Transect #3 (Table 33). Onychomys leucogaster and spermophilus spilosoma were also trapped but to a lesser degree. During the winter sampling period Dipodomys ordii and onychomys leucogaster were caught with spermophilus spilosoma being absent.

Coyotes were observed on several occasions in the mesquite habitat. Mule deer occasionally use this area especially when this habitat is found near the river and when they are in route from the river bottom to the foothills east of the river.

Vegetation consists of mesquite trees with the understory consisting of mixed shrubs and grasses (Table 34). Dalea scotaria was the common shrub found. Six grasses were encountered with sand dropseed being the most common. Winterfat was also encountered but was severely hedged whenever encountered. Severe grazing was encountered throughout this habitat site and some areas were unsuitable for grazing. Mesquite in some locations were so thick that it was impassable for a person to go through. Dalea scotaria provided the most canopy cover which is essentially no cover at all.

TABLE 31

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #3	Date	Species	Summer			Winter		
			Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
	9-11 Dec. 1980	Sage Sparrow				38	.208	180
	9-11 Dec. 1980	Horned Lark				18	.233	75
	29-30 May 1980 11 Dec. 1980	Crissal Thrasher	10	.167	60	3	.100	25
	28 May 1980 11 Dec. 1980	Western Meadowlark	3	.100	25	3	.250	10
	28-30 May 1980	Black-Throated Sparrow	100	.190	526			
	28-30 May 1980	Mockingbird	85	.274	310			
	28-30 May 1980	Brewer's Sparrow	23	.113	199			
	29-30 May 1980	Yellow-Rumped Warbler	8	.100	75			
	28 May 1980	Ash-Throated Flycatcher	5	.167	30			
	29 May 1980	Cowbird Spp.	5	.125	40			
	29 May 1980	Rufous-Crowned Sparrow	3	.125	20			
	29 May 1980	Red-Tailed Hawk	3	.250	10			
	28 May 1980	Black Pheobe	3	.167	15			
	29 May 1980	Western Kingbird		.125	20			

TABLE 32

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS,
AND BIRDS OBSERVED FLYING OVER TRANSECT #3

Lark Bunting	1 observed flying over transect 9 December 1980
Cowbird Spp.	1 observed flying over transect 29 May 1980
Western Kingbird	2 observed flying over transect 29 May 1980, 1 on 28 May
Mourning Dove	2 observed flying over transect 30 May 1980, 4 on 28 May
Mockingbird	1 observed flying over transect 28 May 1980
Sage Sparrow	NB observed winter only
Horned Lark	NB observed winter only
Crissal Thrasher	PB
Western Meadowlark	PB
Black-Throated Sparrow	B
Mockingbird	B
Brewer's Sparrow	PB
Yellow-Rumped Warbler	NB observed migrating 28 May 1980
Ash-Throated Flycatcher	PB
Cowbird Spp.	PB
Rufous-Crowned Sparrow	PB
Red-Tailed Hawk	PB
Black Phoebe	PB
Western Kingbird	PB

TABLE 33

MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #3					
Date Trapped	Specie	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
15 July 1980	Dipodomys ordii	3			
15 July 1980	Spermophilus spilosoma	1			
15 July 1980	Onychomys leucogaster	1			
15 July 1980	Perognathus Spp.	1			
16 July 1980	Spermophilus Spp. spilosoma	1			
17 July 1980	Dipodomys ordii	1			
9 Dec. 1980	Onychomys leucogaster			5	
9 Dec. 1980	Dipodomys ordii			3	
10 Dec. 1980	Dipodomys ordii			4	
10 Dec. 1980	Onychomys leucogaster			2	
	Dipodomys ordii		4		7
	Spermophilus spilosoma		2		
	Onychomys leucogaster		1		7

* Density = Mammals/360 trap nights

TABLE 34

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

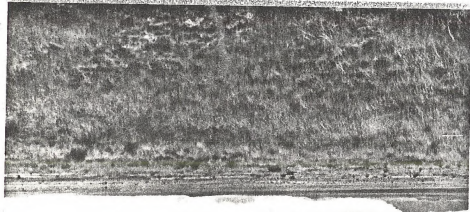
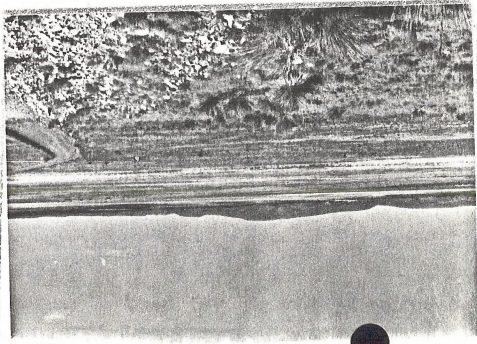
Transect #3					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Xanthocephalum sarrothrae	.4/m ²	7	1.38		5.78
Aristida spp.	.2/m ²	2	.18		2.38
Dalia formosa	.6/100m ²	6	.88	.03	1.95
Sand Dropseed	3.7/m ²	32	1.43		42.13
Winterfat cerritoides	.2/m ²	2	.88		3.08
Wooly Paperflower	8.4/m ²	39	.98		93.38
Unknown spp.	.2/m ²	18	2.23		4.43
Mumroa squarrosa	1.3/m ²	8	.20		14.50
Dalea scotaria	19/100m ²	19	9.25	.10	20.25
Hoffmansigia	.3/m ²	5	.38		3.68
Bouteloua eriopoda	.8/m ²	2	.30		9.10
Unknown spp.	1.6/m ²	11	.28		17.88
Prosopis juliflora	.1/m ²	1	.38		1.48
Yucca glata		1	.38		.38
Unknown spp.	1/m ²	4	.23		11.23
Bouteloua barbata	.1/m ²	1	.03		1.13
Opuntia leptocaulis	.1/m ²	5	.13		1.23
Cholla (Christmas tree)	.1/m ²	1	.98		2.08
Bush muhly	.2/m ²	2	.30		2.50
Spike Dropseed	.2/m ²	2	.05		2.25
Sandsage	6/100m ²	6	.88	.02	.03

Reptiles

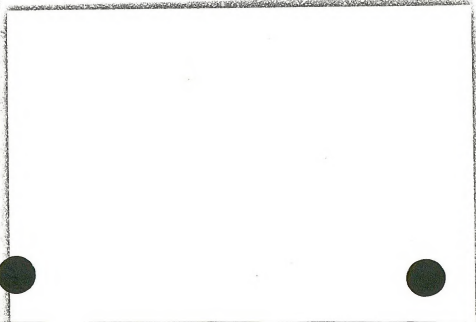
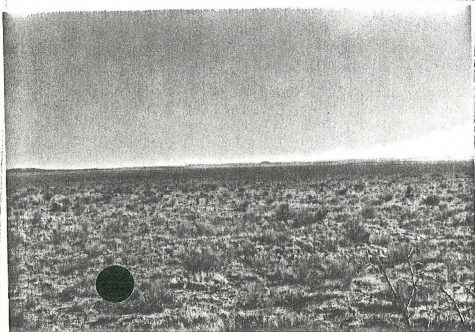
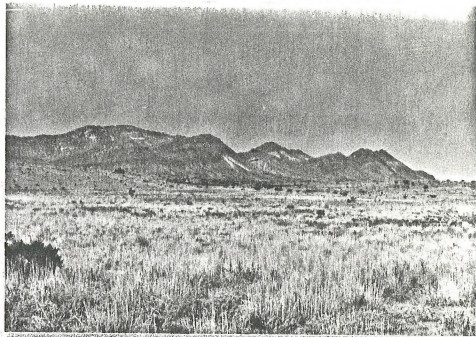
Transect #3. 28 May 1980 - Uta stanburiana (2.5/ha), Cnemidophorus tigris (2.5/ha), Cnemidophorus inornatus (.625/ha), Cnemidophorus neomexicanus (.625/ha), Phrynosoma modestum (.625/ha), Gambelia wislizenii (.625/ha). Arizona elegans observed.

This was another good area for reptiles in terms of diversity, but not density, although this latter observation may be somewhat misleading. Cnemidophorus tigris here was always associated with individual mesquite dunes; lizards would forage out of and around them, but immediately dash back into them when threatened.

Upper Left and Right
Lower Right
Beginning Transect #10
runs in direction of
ranch on Highway 380



Jornada Plains North End



STANDARD HABITAT SITE #7

Grass Pediment

Habitat site - Galleta/black grama, 56,593 acres; Fluff grass/Xasa, 3,277 acres; Bogr/Xasa, 102,784 acres; Boer, 23,177 acres.

This SHS composes most of the Jornada plains which is bisected by Highway 380. The area is predominately short and middle grass types with tall grasses such as giant dropseed and alkali sacaton being found along the edges of Highway 380. Ground cover is sparse with little cover for non-game species. Diversity is low in this area possibly due to extensive grazing by livestock. Shrubs are virtually non-existent in this area.

Birds in this habitat site were typical of a grassland community. Bird diversity is low with horned larks being the most abundant bird (Table 35). Western meadow larks were also common which is another grassland bird. Cassin's kingbird were encountered, but these birds were found at the beginning of the transect where scattered creosote and a few Yucca plants were found. Two hundred meters from the transect beginning, most shrubs were gone and the kingbirds and black-throated sparrows disappeared. Breeding, probable breeding and birds observed flying over Transect #10 is listed in Table 36.

Lark buntings and horned larks were common during the winter in large flocks foraging among the grasses and snakeweed.

Transect #10 was one of the few areas where *Dipodomys spectabilis* was encountered. The *Dipodomys* burrows were colonies made up of several hundred acres then there would be no burrows present in other areas. These burrows can be also identified as *Crotalus viridis viridis* dens. During the spring when the transect was being sent up *Crotalus viridis* were encountered on several occasions sunning at the entrances to some of the burrows. One *Dipodomys* mound was observed with five *Crotalus viridis* at the entrance way of the burrows.

No *spectabilis* was caught in the winter whereas *Dipodomys ordii* was caught. Other specie caught along the transect were *onychomys torridus*, *Peromyscus leucopus*, *Perognathus flavus*, and *Reithrodontomys* species (Table 37). *Perognathus flavus* hibernates during the winter and was not snap-trapped along the winter transect.

Pronghorn were observed in this habitat. Numbers were low in the summer and during the winter sampling period none were observed. Water is hard to find during the summer because some of the ranchers do not graze the range during the summer and turn the water off to the wells. The pronghorn in this area would benefit with several wildlife waters being built.

Vegetation diversity is low with galleta being the dominant plant. Seven grasses were encountered along the transect line (Table 38). Fifteen different plants were identified for the entire vegetative transect. Ground cover is fair in this area, because some of this habitat is grazed only during the winter. The range could be considered pretty good in comparison with areas grazed year-round. There are places where grazing has completely denuded all the vegetation and nothing but bare ground exists. The wind blows away whatever soil was there and the result is a desert like environment where no plants or animals exist. These grasslands are fragile and a few seasons of little rain could cause drastic results.

TABLE 35

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #10	Date	Species	Summer			Winter		
			Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
	13-15 May 1980	Horned Lark	345	.151	2,198	343	.231	1,483
	2-4 Dec. 1980							
	2 Dec. 1980	Sharp Shinned Hawk						
	2 Dec. 1980	Lark Bunting				3	.250	12
	13-15 May 1980	Western Meadowlark	30	.150	200	25	.250	100
	4 Dec. 1980							
	15 May 1980	Violet-Green Swallow				3	.167	15
	13-15 May 1980	Black-Throated Sparrow	10	.083	19			
	13-14 May 1980	Chipping Sparrow	15	.100	150			
	13-14 May 1980	Common Raven	8	.083	90			
	13-14 May 1980	Cassin's Kingbird	5	.083	60			
			13	.139	90			

TABLE 36

BREEDING (B), PROBABLE BREEDING (PB), NON BREEDING (NB) BIRDS
AND BIRDS OBSERVED FLYING OVER TRANSECT #10

Lark Buntings	20 observed flying over 2 December 1980
Horned Lark	6 observed flying over 3 December 1980, 15 flew over 4 Dec.
Common Raven	3 observed flying over 3 December 1980
Horned Lark	B
Sharp-Shinned Hawk	NB observed winter only
Lark Bunting	PB
Western Meadowlark	PB
Violet-Green Swallow	NB
Black-Throated Sparrow	PB
Chipping Sparrow	PB
Common Raven	NB
Cassin's Kingbird	NB

TABLE 37
MAMMAL DENSITIES FOR EACH SPECIE DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #10					
Date Trapped	Specie	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
13-14-15 May 80	Spermophilus spilosoma	3	3		
13-14 May 1980	Dipodomys spectabilis	2	2		
13 May 1980	Peromyscus leucopus	1	1		
13-14-15 May 80	Perognathus flavus	9	9		
14 May 1980	Onychomys torridus	1	1		
2 Dec. 1980	Peromyscus eremicus			1	1
2 Dec. 1980	Onychomys torridus			2	2
2 Dec. 1980	Dipodomys ordii			1	1
4 Dec. 1980	Reithrodontomys montanus			1	1

* Density = Mammals/360 trap nights

TABLE 38
VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

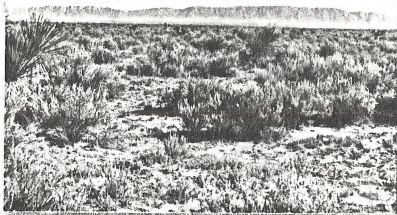
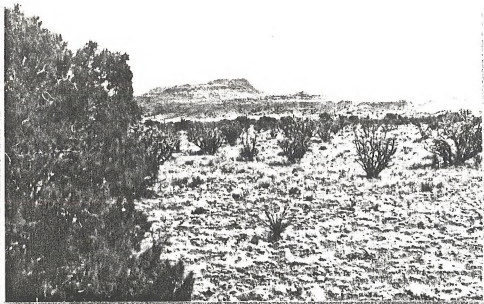
Transect #10					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Alkali sacaton	.6	4	1.05		
Tidestromia	0	5	.125		
Xanthocephalum sarrothrae	.2	2	.175		
Galleta	9.1	35	5.650		
Opuntia (prickly pear)	.5	6	1.680		
Locoweed Spp.	0	1	.025		
Burrograss	.1	1	.150		
Desert Holly	.2	2	.050		
Salsola kali	.8	19	2.880		
Bouteloua eriopoda	3.9	13	2.600		
Fluffgrass	1.7	8	.800		
Euphorbia Spp.	.1	1	.025		
Nightshade	.1	1	.025		
Three-awn Spp.	.1	1	.150		
Ring muhly	1.2	3	.075		

Reptiles

Transect #10. 29 May 1980 - Holbrookia maculata (.625/ha), Cnemidophorus inornatus (8.125/ha). 16 July 1980 - Holbrookia maculata (1.875/ha), Cnemidophorus inornatus (5/ha).

This was an interesting transect because of the apparent paradox between the number of lizards observed here and the nature of the habitat. This is a grassland habitat subject to at least moderate grazing; grass cover was not heavy and there was a considerable percentage of bare ground here; yet lizard numbers were relatively high. Lizard diversity, however, is essentially nil; Cnemidophorus inornatus made up the bulk of the lizards seen.

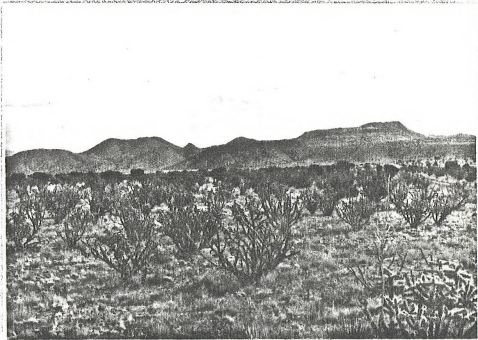
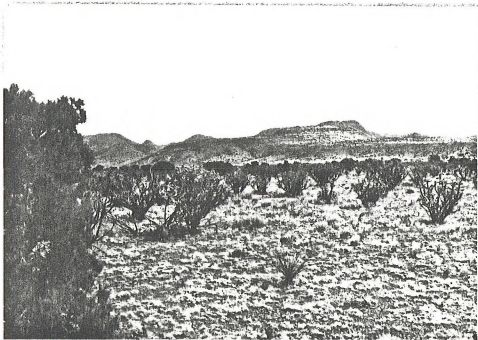
The third and largest portion of the San Antonio-Bingham road-riding route passes essentially through this habitat type. Other species that can therefore be verified for it include Scaphiopus bombifrons, Scaphiopus coudi, Scaphiopus hammondi, Phrynosoma cornutum, Terrapene ornata, Arizona elegans, Gyalopion canum, Heterodon nasicus, Lampropeltis getulus, Lampropeltis triangulum, Pituophis melanoleucus, Rhinocheilus lecontei, Tantilla nigriceps and Crotalus viridis.



Upper Left Transect #7
 Upper Right Typical Habitat for
 & Lower Right Transect #1



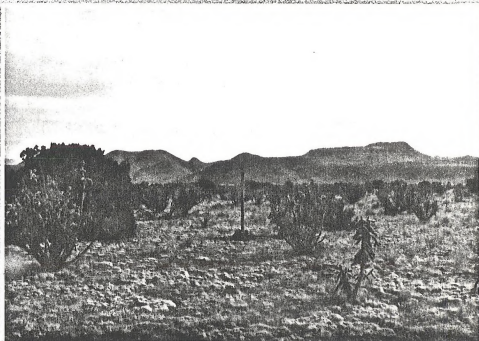
Transect #7 East of Madera Canyon





Upper and Lower Right
Lower Left

Transect #7 Beginning
Typical Habitat



Sand Sage Habitat West of Chupedara Mesa



STANDARD HABITAT SITE #8

Shrub Pediment

Habitat Sites - Yucca/cholla, 91,853; Yucca/sandsage, 86,093; Yucca/galleta, 55,730; Cholla/snakeweed, 4,787; total acres 238,463.

This large SHS composes part of the Jornada plains and the area on the west side of the Missile Range down to the Sierra County line. It is a mixture of short grass, midgrass, tall grass and yucca subtypes. This SHS has a 3,200-acre stand of soaptree yucca which is the northern range of this specie. Yucca types can be found throughout the SHS with it being a dominant plant aspect wise in some places. The grasses occur mostly in the lower lying edges of the Jornada plains where disturbance by humans or livestock seem to be most evident. Species diversity appears low for the SHS possibly due to livestock pressure and lack of good cover.

Bird density was lower than expected in this shrub habitat site (Tables 39 and 40). The 86,093 acres is an extensive soaptree yucca and other yucca spp. that is typical of the Chihuahuan desert farther south. The part of the study area where this type of yucca occurs is the northern end of its range. Understory was sand sage which appears to be the southern range of this plant. Birds breeding in this area was typical of those breeding in other parts of the study area. The most common breeding birds was the black-throated sparrow with Scott's oriole in habitat sites at about 5,300 feet elevation, and mockingbirds being common with black-throated sparrows at 6,300 feet elevation. The black-throated sparrow seems to be a very adaptable bird found in almost every habitat site in the study area. This shrub habitat was the only place in the study area where breeding lark buntings were encountered. Breeding, probable breeding and birds observed in Transects #1 and #7 are listed in Tables 41 and 42.

Raptors use this area extensively throughout the year. Swainson's hawks and kestrels nest on the soaptree yuccas, and during the winter golden eagles, prairie falcons, marsh hawks, redtail hawks, kestrels and ferruginous hawks are commonly found in the shrub habitat.

Sage sparrows were common during the winter months in areas where black-throated sparrows were the most common during the summer.

Mammal density was lower than expected (Tables 43 and 44) Dipodomys ordii, Spermophilus spilosoma, and Onychomys specie were common at 5,300 feet elevation. At 6,300 feet Peromyscus maniculatus, Onychomys spp.,

and *Dipodomys merriami* was common. In sandy soil where soaptree yucca, and sandsage were common *Geomys bursarius* was abundant. This small gopher would rarely come to the surface during the summer preferring to stay deeper underground in the cooler soil. During the winter is when the most surface activity takes place. Many fresh mounds can be seen where during the summer none existed.

Coyotes and kit foxes were verified in the Yucca habitats, while only coyotes were verified in the shrub habitat at higher elevations. A lot of trapping takes place during the winter in certain areas, and mammal predator sign appears low in some places. In these areas cottontail and jack rabbit populations appear to be high; this could be the reason for the large raptor population during the winter months in the areas where trapping appears extensive.

Pronghorn have been observed in this shrub habitat with the highest herds numbering around twenty eight. Pronghorn kidding grounds can be identified by drawing a 3-mile radius circle around any water source and identifying places with cover, arroyos or other suitable habitat. Water is a problem for pronghorn especially down near San Pasqual mountain on the west side of the Missile Range. These water sources for the most part have corrals around them and some pronghorn have a tendency to seek other water sources. This area would be a good place for a few wildlife waters and exclosures.

An interesting contrast can be seen between White Sands Missile Range and the public lands on the west. The Missile Range has not been grazed for a long period of time whereas the public land has been. Soaptree yuccas

appear on the decline in the grazed area whereas the ungrazed area has a flourishing population. Only the taller Yuccas on the grazed side untouched by cattle have seed stalks, whereas every yucca on the ungrazed side has seed stalks. Cattle feed on the seed stalks of the yucca when they are green. This constant grazing on seed stalks of yuccas has stopped new plants from getting started. As a plant dies there are no new ones to take its place and if the present trend continues, the soaptree yucca will eventually die out on public lands subject to intensive grazing.

Plant diversity is good in the higher elevations and moderate in the lower elevations (Tables 45 and 46). Snakeweed is the most common plant with shrubs such as yucca, cholla and sand sage being the most common aspect wise. Black grama is common at 5,300 feet, and blue grama more common at 6,300 feet. Nine other grasses were encountered mostly at the higher elevations and 27 forbs were found. Winterfat was absent in the yucca habitat and present at the higher elevations. Canopy cover is mostly ground cover consisting of grasses.

TABLE 39

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #1	Date	Species	Summer			Winter		
			Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
	2-4 Dec. 1980	Sage Sparrow				115	.201	572
	2-4 Dec. 1980	Horned Lark				20	.222	90
	22-23 May 1980	Loggerhead Shrike	5	.100	50	5	.250	20
	2-4 Dec. 1980							
	4 Dec. 1980	Red-Tailed Hawk				3	.500	5
	24 May 1980	Chipping Sparrow	15	.150	100			
	23 May 1980	Kingbird Spp.	3	.250	10			
	22-24 May 1980	Black-Throated Sparrow	65	.232	280			
	22 May 1980	Lark Bunting	10	.250	40			
	22-24 May 1980	Scott's Oriole	68	.188	359			
	22-24 May 1980	Cactus Wren	30	.250	120			
	22-23 May 1980	Mockingbird	20	.250	80			

TABLE 40

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #7	Date	Species	Summer		Winter	
			Observed Density (Birds)km ²	CD	Observed Density (Birds)km ²	Estimated Density (Birds)km ²
	11 June 1980	Sharp-Shinned Hawk				
	10-12 June 1980	Black-Throated Sparrow	75	.083	904	
	10-12 June 1980	Western Kingbird	30	.171	175	
	10-12 June 1980	Mockingbird	65	.100	650	
	10-12 June 1980	Cactus Wren	18	.100	175	
	10-12 June 1980	Brown Towhee	35	.083	422	15 .125 120
	6-8 Jan. 1981					
	10-12 June 1980	Nighthawk Spp.	10	.083	121	
	10 June 1980	Chipping Sparrow	10	.083	121	
	10 June 1980	Cowbird Spp.	15	.083	181	
	11-12 June 1980	Pinyon Jay	50	.100	500	
	6-8 Jan 1981	Dark-Eyed Junco			133	.174 762

TABLE 40 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #7		Summer		Winter	
Date	Species	Observed Density (Birds)km ²	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	Estimated Density (Birds)km ²
		CD		CD	
6-8 Jan. 1981	Black-Throated Sparrow			18	80
				.218	
8 Jan. 1981	Scaled Quail			30	180
				.167	
8 Jan. 1981	Cactus Wren			20	160
				.125	
8 Jan. 1981	Sage Thrasher			5	40
				.125	
7 Jan. 1981	Ladder-Backed Woodpecker			5	20
				.125	

TABLE 41
BIRDS OBSERVED FLYING OVER TRANSECT #1

Horned Lark	25 observed flying over transect 2 December 1980, 4 observed 4 Dec.
Common Raven	3 observed flying over transect 3 December 1980
Sage Sparrow	NB observed winter only
Horned Lark	NB
Loggerhead Shrike	B
Red-Tailed Hawk	NB observed winter only
Chipping Sparrow	PB
Kingbird Spp.	PB
Black-Throated Sparrow	B
Lark Bunting	PB
Scott's Oriole	B
Cactus Wren	B
Mockingbird	PB

B = Breeding, PB = Possible Breeding, NB = Non-breeding.

TABLE 42
BIRDS OBSERVED FLYING OVER TRANSECT #7

Common Raven	1 observed flying over transect 10 June 1980, 2 observed 11 June
Cassin's Kingbird	2 observed flying over transect 12 June 1980
Sharp-Shinned Hawk	NB
Black-Throated Sparrow	B
Western Kingbird	B
Mockingbird	B
Cactus Wren	B
Brown Towhee	B
Common Nighthawk	PB
Chipping Sparrow	PB
Cowbird Spp.	PB
Pinyon Jay	NB
Dark-Eyed Junco	NB observed winter only
Scaled Quail	PB
Sage Thrasher	NB observed winter only
Ladder-Backed Woodpecker	NB observed winter only

B = Breeding, PB = Possible Breeding, NB = Non-breeding.

TABLE 43
MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #1			Summer		Winter
Date Trapped	Species	Number Trapped	Trapping Success*	Number Trapped	Trapping Success*
15 April 1980	Dipodomys ordii	1			
15 April 1980	Spermophilus spilosoma	1			
2 Dec. 1980	Dipodomys ordii			2	
2 Dec. 1980	Onychomys torridus			1	
3 Dec. 1980	Dipodomys ordii			2	
4 Dec. 1980	Dipodomys ordii			1	
4 Dec. 1980	Onychomys torridus			1	
	Dipodomys ordii		1		5
	Spermophilus spilosoma		1		
	Onychomys torridus				2

* Density = Mammals/360 trap nights.

TABLE 44

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #7					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
11 June 1980	Dipodomys spectabilis	1	1		
11-12 June 1980	Perognathus flavescens	4	4		
11-12 June 1980	Neotoma micropus	2	2		
	Dipodomys merriami	2	2		
6-8 Jan. 1981	Peromyscus maniculatus			13	13
6-8 Jan. 1981	Onychomys torridus			2	2
6-7-8 Jan. 1981	Dipodomys merriami			3	3

* Density = Mammals/360 trap nights

TABLE 45

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #1					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Sandsage	18/100m ²		8.37	.25	
Yucca	8/100m ²		1.60	2.21	
Ephedra spp.	3/100m ²		.25	.01	
EPTO	10/100m ²	1	1.15		12.15
Aristida fendleriana	20/100m ²	2	2.60		24.60
Xanthocephalum sarrothrae	290/100m ²	19	3.20		322.20
Aristida spp.	.9/100m ²	7	.70		10.60
Sporobolus cryptanorus	7.1/100m ²	46	2.15		80.25
Hoffmansigia	.9/100m ²	8	.17		
Bouteloua eriopoda	12.5/100m ²	20	6.70		144.20
Cassia bahinordes	.5/100m ²	5	.25		5.80
Tridens pilosus	1/100m ²	6	.13		11.13
Euphord spp.	2.2/100m ²	11	1.20		25.40
Tidestromia	.2/100m ²	2	.03		2.23
Zinna Grandiflora	.5/100m ²	1	.03		5.50
Muhlenbergia porteri	.5/100m ²	3	.45		6.00
Hilaria jamesii	.9/100m ²	2	.53		10.43

TABLE 46

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #7					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Euforbia Spp.	9.2	43	3.550		
Trabus berteronianus	2.0	12	.300		
Bouteloua gracilis	22.7	47	8.400		
Aristida adsencionis	.5	4	.225		
Xanthocephalum sarrothrae	5.4	47	6.400		
Portulaca retusa	10.3	31	3.350		
Euphorbia seryllifolia	1.9	12	.425		
Purple Flower	1.8	12	.300		
Senegio longilobus	4.6	24	1.200		
Ring muhly	13.4	28	5.530		
Bouteloua eriopoda	9.7	22	2.900		
Aristida spp.	.2	2	.050		
Enneapogon desleauxii	1.0	4	.225		
Erigeron abajoensis	.2	2	.050		
Sordida	.6	4	.225		
Locoweed Spp.	1.0	10	.375		
Sanvitalia aberti	2.6	14	.600		
Cholla	.2	4	2.800		
Gray Oak	.7	5	1.900		
Euphorbia aevduta	.4	4	.100		

TABLE 46 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIE
DOCUMENTED ON TRANSECT LINE

Transect #7					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Tidestromia lanusinesa	.50	4	.225		
Winterfat	.90	5	.125		
Jimsonweed	.10	1	.025		
Amaranthus albus	.40	1	1.130		
Amaranthus retroflaus	.10	2	.175		
Sphaeralcer	1.20	8	1.050		
Munnia squarrosa	.10	1	.025		
Zinnia grandiflora	.20	1	.025		
Gilia ribiduta	.20	2	.175		
Euforbia spp.	.50	4	.100		
Sideoats grama	9.80	22	4.400		
Unknown spp.	.10	1	.025		
Galleta	4.00	11	1.400		
Unknown Spp.	.60	2	.175		
Unknown Spp.	.20	1	.150		
Amaranthus Spp.	1.00	5	.125		
Unknown Spp.	.10	1	.025		
SPCR	.40	1	.150		
Erigeron nudiflorus	.50	1	.150		
HASP	.10	1	.025		
Unknown Spp.	.60	1	.150		

Reptiles

Transect #1. 22 May 1980 - Cnemidophorus inornatus (7.5/ha), Uta stansburiana (6.25/ha), Sceloporus undulatus (4.375/ha), Holbrookia maculata (1.25/ha), Gambelia wislizenii (.625/ha). Masticophis flagellum and Terrapene ornata observed, the former collected.

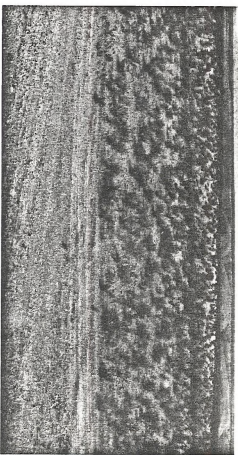
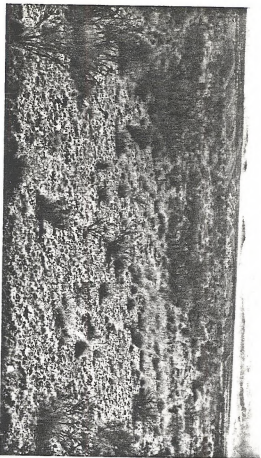
22 July 1980 - Cnemidophorus inornatus (1.25/ha), Uta stansburiana (2.5/ha), Sceloporus undulatus (1.875/ha), Holbrookia maculata (.625/ha).

This was one of the most productive areas for reptiles, both in numbers and diversity. The vegetation structure is diverse; there is abundant cover; and soil texture and composition allows for easy burrowing for shelter and food. Almost all Sceloporus undulatus seen here were on or in yuccas; individuals were not seen far from the shelter of one of these plants in any case. These lizards utilize yuccas here as they do trees in other habitats, spending considerable portions of their lives on them. This species would not exist in this habitat if not for the presence of yuccas, which also provide microhabitats that are utilized by other species of animals as well. This is also an important habitat for Terrapene ornata.

This area also vividly demonstrated the effect on reptiles of the progressively harsh environmental conditions that existed during the summer of 1980. Lizards were abundant and active all over this area in May, but by the end of July there were few lizards about and these were restricted in their activity, being flushed by the observer rather than

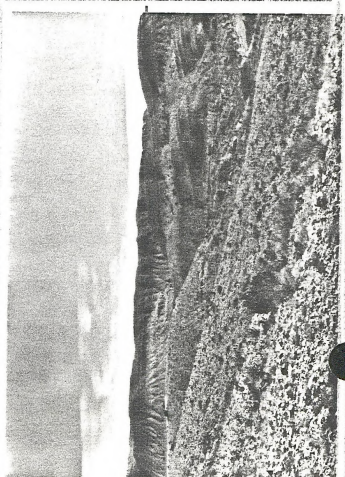
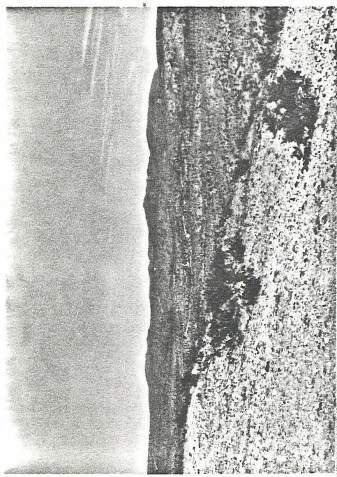
actively foraging. Uta stansburiana seen in July were almost all juveniles; no juveniles of any other species were seen. It is normal for the adults of all lizard species in the desert of New Mexico to disappear toward the latter third of the summer. There were, however, fewer lizards about and an earlier disappearance of adults in this case than in milder or more normal years.

Transect #7. 19 June 1980 - Density estimates were not obtained for this transect. The weather turned suddenly stormy over the nearby Magdalena Mountains during inventory on this transect, and rain squally and high winds impacting the area had a definite effect on reptile activity. No lizards were seen until the return trip from the end of the transect, when five Cnemidophorus unipareus and one Phrynosoma modestum were observed. Pituophis melanocephalus was observed in this habitat in October.



Typical creosote brush west of Rio Grande River
south from the city of Socorro to the Socorro
County line.

Creosote east of the Rio Grande River



STANDARD HABITAT SITE #9

Creosote Hill

Habitat Sites - Creosote/Boer, 97,501; Creosote/Rhus macroflora, 1,562;
total acres 99,063.

This SHS is the most common creosote habitat in the study area. The principal areas are the rolling upland hills east and west of the Rio Grande. Ground cover is sparse when creosote occurs in thick stands. This area has many arroyos that run toward the river. The arroyo bottoms have thick stands of Apache-plume and rhus macroflora with creosote on the south-facing slopes and black grama on the north-facing sides. Some of the arroyos such as Milligan Gulch, Nogal Canyon, Arroyo de Las Canas to name a few are several 100 meters across. The most diversity in plants and animals occurs in the arroyo bottoms, with little species diversity between the arroyos where creosote is the dominant plant. Soil type is loose sandy loam with quite a conglomeration of rock materials from basalt rock to granite.

This habitat is the classic creosote bush community. Creosote is the dominant and largest plant for the most part with black grama being the typical grass. A large part of land on both sides of the Rio Grande from the city of Socorro south to the county line contains creosote bush. Bird species is mostly composed of black-throated sparrows. This bird dominates the creosote community during the summer and sage sparrows dominate the community during the winter. Transect #4 was the only transect run in the winter that had black-throated sparrows and sage sparrows seen together in one flock (Table 48). Other birds observed along the transect appeared to mostly be in the arroyos where *Rhus macrofilia* and Apache-plume flourished. The creosote habitat along the river is cut by numerous arroyos that flow from the Magdalenas and San Mateos on the west and the Loma de las Canas, San Pasqual and Fra Cristobals on the east. The arroyos range in size from only several feet across to as large as Nogal Canyon, Milligan Gulch, and Arroyo de Las Canas. In most of the arroyo bottoms there is some Apache-plume or *Rhus*. The wider the arroyo bottom the more *Rhus* and Apache-plume there is. It is in these arroyo bottoms where most of the other birds exist. Crissal thrashers, mockingbirds, ash-throated flycatchers and Scott's orioles are only found in these arroyos. Black-throated sparrows are usually the only birds found breeding between the arroyos where creosote is the dominant plant. To give an example of the number of arroyos there are: when transect #4 was set up running north to south for one mile, the transect crossed seven arroyos (three large ones and four smaller ones). Scaled quail was also observed breeding in this creosote habitat in the arroyo bottoms. Breeding, probable breeding and birds observed flying over Transect #4 is listed in Table 49.

A good mammal population was found along this transect (Table 50). The most diversity was in the arroyos where Neotoma albigula, Pereomyscus eremicus and Reithrodontomys megalotis were common. In the creosote between the arroyos Dipodomys merriami, Dipodomys spectabilis and Onychomys torridus were common in burrow colonies that were extensive in a few places. This was the one habitat site that Notiosorex crawfordi were expected to be trapped. Pit traps were set up mostly along the arroyo sides in rocky areas but none were trapped.

Large mammals that use these arroyos include both mule deer and pronghorn. Pronghorn have been observed in arroyo bottoms along the edge of the creosote habitat and half shrub grass habitats. Mule deer have been observed only in the arroyo bottoms. The creosote does not offer enough cover for deer so they avoid the exposed ridges between the arroyos and travel up and down the arroyos browsing on the Rhus, Apache-plume forbs, and looking for water. Some of the larger arroyos could be acting as corridors that deer are using to move from one place to another. They appear only to use the creosote ridges to go to another arroyo.

Plant diversity was highest in the arroyos. Black grama grows extensively on the north-facing sides of the arroyos in dense mats with the south-facing side being mostly creosote, and Opuntia spp. Four grasses, and only four forbs were identified along the transect (Table 51). Creosote provided most of the cover between arroyos and Apache-plume, Rhus macrofilia provided most of the cover in the arroyo bottoms. Cattle grazing appears low in this habitat because of a lack of forage.

TABLE 47

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #4		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
8 Dec. 1980	Horned Lark				10	.100	100
3-4-8 Dec. 1980	Sage Sparrow				95	.271	350
3-5 June 1980	Black-Throated Sparrow	265	.217	1,221	20	.250	80
4-8 Dec. 1980							
4-8 Dec. 1980	Lark Bunting				13	.250	50
3 June 1980	Crissal Trasher	5	.167	30	5	.250	20
4-8 Dec. 1980							
3 June 1980	Common Nighthawk	13	.250	50			
3-5 June 1980	Scaled Quail	10	.167	60			
3-5 June 1980	Mockingbird	5	.500	10			
3 June 1980	Mourning Dove	3	.125	24			
5 June 1980	Ash-Throated Flycatcher	3	.100	30			
4 June 1980	Loggerhead Shrike	3	.250	10			
3 June 1980	Scott's Oriole	3	.250	12			

TABLE 48
BIRDS OBSERVED FLYING OVER TRANSECT #4

Lark Bunting	3 observed flying over transect 8 December 1980, 1 observed 4 Dec.
Cowbird Spp.	2 observed flying over transect 5 June 1980
Western Kingbird	1 observed flying over transect 5 June 1980
Mourning Dove	2 observed flying over transect 4 June 1980
Bronzed Cowbird	1 observed flying over transect 4 June 1980
Hummingbird Spp.	1 observed flying over transect 4 June 1980
Barn Swallow	1 observed flying over transect 4 June 1980
Horned Lark	NB observed winter only
Sage Sparrow	NB observed winter only
Black-Throated Sparrow	B
Lark Bunting	NB observed winter only
Crissal Thrasher	B
Common Nighthawk	B
Scaled Quail	B
Mockingbird	PB
Mourning Dove	PB
Ash-Throated Flycatcher	PB
Loggerhead Shrike	PB
Scott's Oriole	PB

TABLE 49

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #4					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
3 June 1980	Perognathus intermedius	4			
	Dipodomys merriami	1			
	Dipodomys spectabilis	1			
	Neotoma albigula	1			
4 June 1980	Peromyscus eremicus	1			
	Onychomys torridus	1			
	Dipodomys merriami	2			
	Perognathus intermedius	1			
5 June 1980	Neotoma albigula	1			
	Peromyscus eremicus	1			
	Onychomys torridus	1			
	Neotoma albigula	1			
9 Dec. 1980	Perognathus intermedius	2			
	Reithrodontomys megalotis			3	
	Peromyscus eremicus			1	
	Dipodomys merriami			6	
	Onychomys torridus			4	

TABLE 49 (continued)

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #4		Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
Date Trapped	Species				
10 Dec. 1980	Perognathus intermedius			1	
	Peromyscus eremicus			2	
	Reithrodontomys megalotis			1	
	Dipodomys merriami			1	
11 Dec. 1980	Dipodomys merriami			7	
	Dipodomys merriami		3		14
	Perognathus intermedius		7		1
	Dipodomys spectabilis		1		
	Peromyscus eremicus		2		3
	Neotoma albigula		3		
	Onychomys torridus		2		4
	Reithrodontomys megalotis				4

* Density = Mammals/360 trap nights

TABLE 50

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #4					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Creosote	18.5/100m ²		.43	.26	
Opuntia spp.	.5/100m ²		.02	.01	
Fallugia paradoxia	10/100m ²		.92	.78	
Rhus macrofilia	1/100m ²		1.61	1.74	
Prickly-leafed Dogweed	1.4/m ²	12	2.50		17.90
Burrograss	7.7/m ²	33	1.90		86.60
Xanthocephalum sarrothrae	3.7/m ²	28	5.50		46.20
Bouteloua eriopod	6.3/m ²	25	2.93		72.23
Artemisa	.4/m ²	3	.08		4.48
Unknown spp.	.1/m ²	1	.03		1.13
Unknown spp.	.1/m ²	1	.03		1.13
Four-wing Saltbush	.1/m ²	1	.15		1.13
Forb Spp.	.1/m ²	2	.05		1.15
Greenleaf		1	.03		.03
Three-awn Spp.	.1/m ²	1	.03		1.13
Mesa Dropseed	.2/m ²	1	.15		2.35

Reptiles

Transect #4. 21 May 1980 - Uta stansburiana (4.234/ha), Cnemidophorus tigris (2.823/ha), Holbrookia texana (.7057/ha). Masticophis flagellum collected.

15 July 1980 - Uta stansburiana (.625/ha), Cnemidophorus tigris (10.625/ha), Unidentified (.625/ha).

This is ideal Cnemidophorus tigris habitat. The low number seen in May was probably due to running the transect too early in the morning when substrate and air temperatures were relatively low; this species prefers warmer temperatures for activity than most other sympatric reptiles. This is supported by the facts that more lizards of this species were beginning to be active in typical fashion at the completion of the transect in May and the increase in numbers observed in July was not noticeably due to young of the year. Uta stansburiana, on the other hand, began to become inactive at the completion of the transect in May.

The transect here crossed several large arroyos. Holbrookia (Cophosaurus) texana was abundant but confined to these arroyos and their edges, so that the density estimate given here for this species is undoubtedly inaccurate. The unidentified lizard seen in July was probably Sceloporus magister.

The second portion of the San Antonio-Bingham road-riding route as well as a portion of the NM St. Highway 1 route runs through habitats than can be considered identical to this habitat type. Species are Arizona elegans, Hypsiglena torquata, Lampropeltis getulus, Pituophis melanoleucus, Rhinocheilus lecontei, Tantilla nigriceps, Crotalus atox, Crotalus viridis and Scaphiopus couchi.



Beginning of Transect #14



STANDARD HABITAT SITE #10

Mixed Shrub Grass Valley

Habitat Site - Cholla/yucca, 18,263 acres.

This SHS is on the east side of the District. It is a narrow valley only three miles wide at its widest point and narrowing down to only one mile wide. The valley is on the east side of Chapadera mesa and follows it to the south into Lincoln County where the valley widens. The valley has scattered junipers which are invading from the mesa. Cholla and Yucca are aspect wise the dominant plant but black gram is the most abundant vegetation.

Birds observed in this habitat site are similar to those in a pinyon-juniper woodland and shrub pediment habitat. This habitat site could probably be merged with the pinyon-juniper woodland. However, because the landform and vegetation are different it will be presented here as a separate habitat site. The transect comes within 200 meters of a stand of juniper trees and the ash-throated flycatcher, western kingbird, and western meadowlark was using the edge of the juniper trees and the shrub habitat. Black-throated sparrows and mockingbirds were the most common birds observed along the transect line in the summer, and sage sparrows and dark-eyed juncos were the most common during the winter (Table 52). This was the only transect where breeding sage thrashers were observed. Breeding, probable breeding, and birds observed flying over Transect #14 is listed in Table 53.

Dipodomys ordii was the common mammal trapped in this habitat (Table 54). Dipodomys colonies ranged in size from about $\frac{1}{4}$ acre up to several acres in size.

Pronghorn have been observed in this habitat site, a small herd of pronghorn use this area and south into Lincoln County. Mule deer also move through the habitat site and use the area periodically. The Missile Range is one mile to the west and deer numbers are good there due to the lack of hunting pressure.

Nine grasses and twelve forbs were verified on the vegetative transect (Table 55). Snakeweed and black grama had the highest density and

canopy cover. So canopy cover leaned toward a grassland type habitat with cholla being the common shrub. However, there were scattered juniper which influenced tree dwelling birds. This area appeared to be grazed only during the winter months and allowed to rest during the summer. Bare ground composed 40 percent of the cover with small rock making up another 21 percent. Black grama had a tendency to be in mats with scattered galleta and winterfat between. The winterfat showed heavy utilization by livestock and wildlife and for the most part was small with little new growth.

TABLE 51
BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #14		WINTER AND SUMMER SPECIES, DATE, AND					
Date	Species	Summer			Winter		
		Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
6-8 Jan. 1981	Townsend's Solitaire						
6-8 Jan. 1981	Dark-Eyed Junco				3	.125	20
7 Jan. 1981	Sage Sparrow				138	.138	996
8 Jan 1981	Horned Lark				18	.167	105
8 Jan 1981	Kestrel				13	.156	80
8-10 July 1980	Black-Throated Sparrow	73	.269	270	3	.500	5
8-10 July 1980	Mockingbird	43	.283	150			
8-10 July 1980	Cactus Wren	28	.500	55			
8-10 July 1980	Meadowlark	23	.281	80			
8-10 July 1980	Ash-Throated Flycatcher	20	.400	50			
8-10 July 1980	Loggerhead Shrike	15	.330	45			
8-10 July 1980	Sage Thrasher	10	.500	20			
8-10 July 1980	Mourning Dove	3	.125	20			

TABLE 51 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #14		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
8-10 July 1980	Great Horned Owl	3	.125	20			
8-10 July 1980	Western Kingbird	3	.250	10			
8-10 July 1980	Red-Tailed Hawk	3	.500	5			
8-10 July 1980	Cowbird Spp.	3	.167	15			
8 July 1980	Black Phoebe	3	.500	5			

TABLE 52
BIRDS OBSERVED FLYING OVER TRANSECT #14

Common Raven	1 observed flying over transect 7 Jan 1980
Black-Throated Sparrow	1 observed flying over transect 8 July 1980, 1 observed 9 July
Mourning Dove	3 observed flying over transect 8 July 1980
Sage Thrasher	1 observed flying over transect 8 July 1980
Cowbird Spp.	5 observed flying over transect 8 July 1980
Common Nighthawk	17 observed flying over transect 9 July 1980
Mockingbird	1 observed flying over transect 9 July 1980
Western Meadowlark	1 observed flying over transect 9 July 1980
Western Kingbird	1 observed flying over transect 9 July 1980
Townsend's Solitaire	NB observed winter only
Dark-Eyed Junco	NB observed winter only
Sage Sparrow	NB observed winter only
Horned Lark	NB observed winter only
Kestrel	PB
Black-Throated Sparrow	B
Mockingbird	B
Cactus Wren	B
Western Meadowlark	B
Ash-Throated Flycatcher	B
Loggerhead Shrike	B
Mourning Dove	PB
Great-Horned Owl	NB

TABLE 52 (continued)
BIRDS OBSERVED FLYING OVER TRANSECT #14

Western Kingbird	PB
Red-Tailed Hawk	NB
Cowbird Spp.	PB
Black Phoebe	PB

B = Breeding, PB = Possible Breeding, NB = Non-breeding

TABLE 53
MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #14					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
10 July 1980	Perognathus flavus	1	1		
11 July 1980	Perognathus intermedius	1	1		
9 July 1980	Spermophilus spilosoma	2	2		
9-10 July 1980	Dipodomys ordii	7	7		
11 July 1980	Onychomys leucogaster	2	2		
6 Jan. 1981	Peromyscus truei			1	1
6-7 Jan. 1981	Peromyscus maniculatus			4	4
6-7-8 Jan. 1981	Dipodomys ordii			5	5
6-7 Jan 1981	Onychomys leucogaster			4	4
7 Jan. 1981	Perognathus flavescens			1	1

* Density = Mammal/360 trap nights

TABLE 54

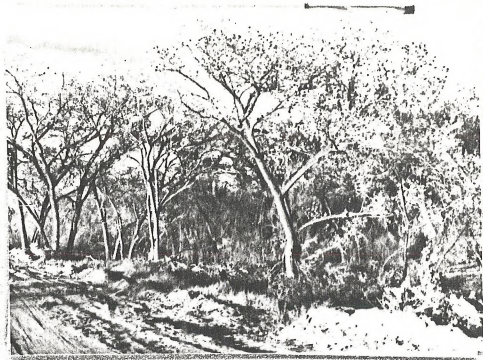
VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #14					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Euforbia philifolia	4/m ²	28	1.58		45.58
Hilaria jamesii		1	.03		.03
Limonium limbatum	.2/m ²	1	.03		2.23
Xanthocephalum sacrothrae	10.3/m ²	53	7.40		120.70
Bouteloua eriopoda	15.1/m ²	55	5.28		171.38
Happlopappus spinulosus		1	.03		.03
Winterfat	3/m ²	24	2.28		35.78
Mesa Dropseed	.5/m ²	5	.25		5.75
Sphaeralcea aigitata	4.5/m ²	28	1.45		50.95
Fluffgrass	3.8/m ²	19	.60		42.40
Agave	.4/m ²	4	2.73		7.13
Cholla spp.	.2/m ²	3	1.15		3.35
Leucelene ericoides	.3/m ²	1	.03		3.34
Spike Dropseed	.7/m ²	4	.23		7.93
Ring muhly	1.3/m ²	4	.20		14.50
Bouteloua gracilis	4.6/m ²	13	2.00		52.60
Bouteloua barbata	1.8/m ²	8	.20		20.00
Euforbia spp.	.1/m ²	1	.03		1.13
Hilaria jamesii	1.8/m ²	7	.43		20.23
Lemonweed	1.1/m ²	7	.18		12.28

TABLE 54 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #14					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Indian paintbrush	.2/m ²	1	.03		2.23
Ephedra spp.	.1/m ²	1	.03		1.13
Rattlesnake euforbia	.8/m ²	6	.28		9.08
Hoffmansigia	.2/m ²	2	.05		2.25
Chamaesaracha sordida	.8/m ²	6	.15		8.95
Zinnia grandiflora	.1/m ²	1	.03		1.13
Chamaesaracha sordida	.3/m ²	3	.20		3.50
Sporobolus cryptandrus	1/m ²	2	.18		11.18
Small rock		86	21.43		
Litter		96	12.90		
Bare ground		98	39.93		

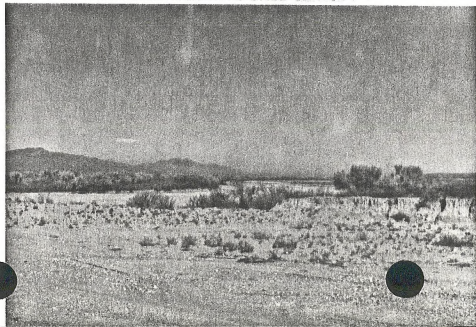


Upper Left
& Right

Bosque tract along
Transect #11

Lower Right

Dry river bed at mouth of
Arroyo De las Canas



Upper Right

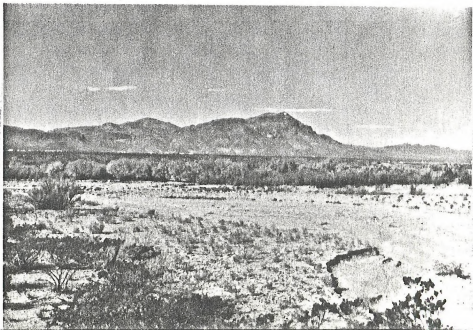
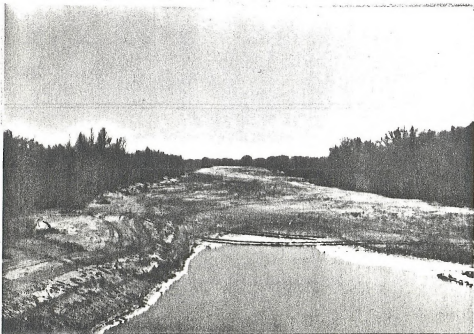
Perennial Stream
Arroyo De las Canas

Lower Left

Dry river bed of Rio Grande
River from the Escondida Bridge

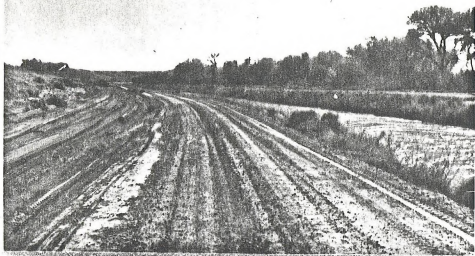
Lower Right

Bosque tract along dry Rio
Grande River mouth of Arroyo
De las Canas

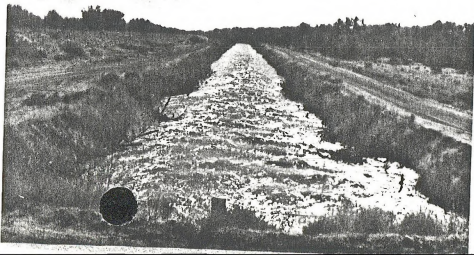
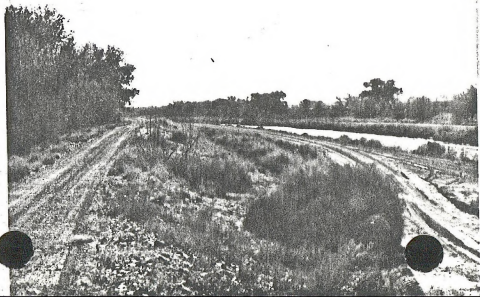




Beginning of Transect #11



Rio Grande Conveyance Channel east of Socorro



Reptiles

Transect #14. 5 June 1980 - Cnemidophorus inornatus (5.625/ha), Uta stansburiana (1.875/ha), Sceloporus undulatus (.625/ha); Unidentified (.625/ha). Phrynosoma douglassi collected 11 July 1980. Scaphiopus couchi heard. The first two species were common. Sceloporus was associated with the scattered junipers in this habitat.

STANDARD HABITAT SITE #11

Riparian

Habitat Site - Cottonwood/Tamarisk, 4,000 acres.

This area comprises the Rio Grande and its floodplain in the Socorro District. The dominant vegetation is saltcedar with some areas being so dense that it is impassable for a person on foot. Cottonwood use to be the dominant tree but it is rapidly disappearing. Illegal woodcutting is a serious matter with many areas of cottonwoods showing serious signs of devastation by chainsaws. Narrow belts of cottonwoods can be found along the edges of the conveyance channel and in places along the edge of the river. These narrow belts have the highest diversity of avian specie with many specie of birds being found no where else in the district but in these narrow belts. These areas are sometimes subjected to flooding during the spring and during severe thunderstorms in the summer. Ground cover is sparse with little regrowth of cottonwood. Where woodcutting has opened up canopy cover in the stands, tamarisk has begun to grow. Also fires along the river are common and where fires have occurred tamarisk is the first tree to come back, out competing cottonwoods. Avian specie are directly related to cottonwoods and without cottonwoods most, if not all, of the riparian song birds would be lost.

The riparian zone along the Rio Grande appears to be the most heavily abused habitat in the study area. Most of the original cottonwood stands have been cleared and made into irrigated farmland. The remaining stands show severe woodcutting, dumping of trash, intensive use by livestock, fires which destroy the cottonwood trees allowing salt cedar to invade roads and livestock grazing. The Bureau of Reclamation did an extensive flood control project by creating the conveyance channel which eliminated more cottonwoods. Threats have been made in the past to eliminate all cottonwood trees along the river because of too much water usage, and the cottonwoods (Bosque tract) have been subjected in past years to spraying of herbicides and pesticides.

The Bosque tract had the highest bird diversity in the study area (Table 56). Most migrating song birds use this habitat for breeding and if the Bosque disappeared so would the birds. It was also found to be the major nesting area for mourning doves. Breeding mourning doves were the most common bird found along the transect line. Thirty-three bird species were observed along the transect. The most colorful birds in the study area are encountered in cottonwood stands, such as the summer tanager, blue grosbeak, northern oriole, and western tanager. Breeding, probable breeding and birds observed flying over Transect #11 is listed in Table 57.

Any Bosque tract found to be public land should be protected, reseeded, patrolled, and law violations enforced to insure the continued existence of this habitat.

Dense stands of saltcedar show little wildlife use. Because of the dense growth, there is usually very little wind and consequently high temperatures are created by the dense growth.

Reseeding cottonwoods have proven to be as high as 80 percent effective when saltcedar was eliminated first. The cottonwood will shade out the saltcedar if it gets big enough.

Most of the game birds hunted are found along the river. Waterfowl use the Bosque del Apache Wildlife Refuge to roost in and then feed in many of the farmlands. The Gambel's quail nest in cottonwood stands almost entirely and are usually found only along the river. The Bosque tract along the river is the principal breeding habitat for the mourning dove. Breeding doves are as high as 875 birds/km². These cottonwood stands are necessary to continue the existence of mourning doves.

Three endangered birds were observed using the riparian zone along the river. They are the bald eagle, osprey and the black hawk. One black hawk was observed north of Elephant Butte March during the summer, one osprey was observed inside the Socorro city limits for two weeks in the fall and bald eagles have been observed up and down the river during the winter.

Small mammal densities are low in the Bosque probably due to a lack of understory in the mature cottonwoods and lack of a food source elsewhere (Table 58). Dipodomys merriami and Peromyscus maniculatus are the common small mammals found. Mule deer use the Bosque whenever possible.

When cottonwoods flourish they offer good cover for deer. Many of the deer use the Bosque periodically moving up and down from the hills on both sides of the river.

Vegetation along the river is composed of cottonwood, tamarisk overstory with an understory of forbs, grasses and shrubs (Table 59). In thick stands of cottonwoods the understory is either open or thick with tamarisk depending on past fires.

TABLE 55

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #11		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
16-18 Dec. 1980	Dark-Eyed Junco				670	.154	435
16-17 Dec. 1980	Northern Oriole	23	.167	135	5	.167	30
16 Dec. 1980	Unknown Spp.				3	.100	25
16-18 Dec. 1980	Gambel's Quail				58	.100	575
16-17 Dec. 1980	Red-Tailed Hawk				3	.167	45
16 Dec. 1980	White-Crowned Sparrow				35	.250	140
16 Dec. 1980	Chipping Sparrow				58	.250	230
17-19 June 1980 17-18 Dec. 1980	Common Flicker	10	.167	60	8	.250	30
17 Dec. 1980	Cooper's Hawk				3	.167	15
18 June 1980 18 Dec. 1980	Kestrel	3	.100	25	3	.250	10
17-19 June 1980 17-18 Dec. 1980	Red-Winged Blackbird	18	.167	105	8	.250	30
18 June 1980 17-18 Dec. 1980	Rufous-Sided Towhee	3	.125	20	5	.167	30

TABLE 55 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #11		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
18 Dec. 1980	Prairie Falcon				-	-	-
18 Dec. 1980	Bewick's Wren				3	.1	25
17-19 June 1980	Mourning Dove	140	.160	875			
17-19 June 1980	Mockingbird	45	.120	375			
17-19 June 1980	Black-Headed Grosbeak	35	.137	256			
17-19 June 1980	Starling	35	.117	299			
17-19 June 1980	Ash-Throated Flycatcher	28	.138	199			
17-19 June 1980	House Finch	25	.125	200			
17-19 June 1980	Robin	18	.175	100			
17-18 June 1980	Hummingbird Spp.	15	.125	120			
17-19 June 1980	Hairy Woodpecker	13	.167	75			
17-19 June 1980	Blue Grosbeak	10	.167	60			
17-19 June 1980	Say's Phoebe	8	.188	40			

TABLE 55 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #11		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
17-18 June 1980	Yellow-Billed Cuckoo	5	.167	30			
17-19 June 1980	Phainopepla	5	.167	30			
19 June 1980	Epiminax Spp.	5	.250	20			
17-19 June 1980	Summer Tanager	5	.125	40			
19 June 1980	Great Horned Owl	3	.100	25			
17 June 1980	Cowbird Spp.	3	.125	20			
17 June 1980	Western Meadowlark	3	.125	20			
17 June 1980	Roadrunner	3	.100	25			

TABLE 56
BIRDS OBSERVED FLYING OVER TRANSECT #11

Canada Geese	26 observed flying over transect 16 Dec. 1980, 66 observed 17 Dec.
Starlings	25 observed flying over transect 16 Dec. 1980
Red-Winged Blackbird	6 observed flying over transect 16 Dec. 1980
Sandhill Crane	13 observed flying over transect 16 Dec. 1980 63 observed 17 Dec.
Horned Lark	10 observed flying over transect 16 Dec. 1980
Phainopepla	1 observed flying over transect 16 Dec. 1980
Duck Spp.	50 observed flying over transect 17 Dec. 1980 very high
Blackbird Spp.	15 observed flying over transect 17 Dec. 1980
Sandhill Crane	39 observed flying over transect 18 Dec. 1980
Mallards	6 observed flying over transect 18 Dec. 1980
Canada Geese	20 observed flying over transect 18 Dec. 1980
Western Kingbird	3 observed flying over transect 17 June 1980
Cowbird Spp.	12 observed flying over transect 17 June 1980
House Finch	1 observed flying over transect 17 June 1980 2 observed 18 June, 3 observed 19 June
Red-Winged Blackbird	1 observed flying over transect 17 June 1980 2 observed 18 June, 5 observed 19 June
Mourning Dove	3 observed flying over transect 17 June 1980 7 observed 18 June, 6 observed 19 June
Black-Headed Grosbeak	2 observed flying over transect 17 June 1980
Starling	1 observed flying over transect 17 June 1980
Phainopepla	1 observed flying over transect 18 June 1980
Swainson's Hawk	1 observed flying over transect 18 June 1980
Mockingbird	1 observed flying over transect 19 June 1980

TABLE 56 (continued)
BIRDS OBSERVED FLYING OVER TRANSECT #11

Ladder-Backed Woodpecker	1 observed flying over transect 19 June 1980
Common Flicker	1 observed flying over transect 19 June 1980
Dark-Eyed Junco	NB observed winter only
Northern Oriole	B
Gambels Quail	B
Red-Tailed	B
White-Crowned Sparrow	NB observed winter only
Chipping Sparrow	NB observed winter only
Common Flicker	B
Cooper's Hawk	PB
Kestrel	B
Red-Winged Blackbird	B
Rufous-Sided Towhee	B
Prairie Falcon	NB observed winter only
Bewick's Wren	NB observed winter only
Mourning Dove	B
Mockingbird	B
Black-Headed Grosbeak	B
Starling	B
Ash-Throated Flycatcher	B
House Finch	B
American Robin	B
Hummingbird Spp.	B

TABLE 56 (continued)
BIRDS OBSERVED FLYING OVER TRANSECT #11

Hairy Woodpecker	PB
Blue Grosbeak	B
Say's Phoebe	PB
Yellow-Billed Cuckoo	B
Phainopepla	PB
Epominae Spp.	B
Summer Tanager	B
Great-Horned Owl	B
Cowbird Spp.	PB
Western Meadowlark	PB
Roadrunner	PB

B = Breeding, PB = Possible Breeding, NB = Non-breeding

TABLE 57

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #11					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
17 June 1980	Dipodomys merriami	2	2		
18 June 1980	Peromyscus leucopus	1	1		
16 Dec. 1980	Peromyscus maniculatus			11	11
16-17-18 Dec. 1980	Reithrodontomys montanus			3	3

* Density = Mammals/360 trap nights

TABLE 58

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #11					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
<i>Bouteloua barbata</i>	36.50	72	8.680		
<i>Euforbia philofofia</i>	1.80	12	.675		
<i>Erigeron divergens</i>	1.65	7	.300		
<i>Xanthocephalum sarrothrae</i>	3.20	38	4.830		
Fluffgrass	1.40	7	.175		
Sand Dropseed	5.05	31	1.530		
<i>Sasola kali</i>	.75	8	.450		
<i>Xanthocephalum sarrothrae</i> seedling	2.65	11	.275		
<i>Seneco multicapus</i>	2.50	17	.425		
<i>Euforbia</i> spp.	8.75	37	2.050		
Four-wing Saltbush	.10	2	.050		
Tamarisk	4-ha		4.550	11.64	
Sand Dropseed	.05	1	.025		
Four-wing Saltbush	.40	10	5.580		
<i>Chloris virgata</i>	.30	3	.075		
<i>Populus fremontii wislizenii</i>	12-ha		21.350		
<i>Aristida adscensionis</i>	3.20	15	.850		
Mesa Dropseed	.15	3	.450		
<i>Salvia</i> spp.	1.75	2	.175		
<i>Seneco multicaputatus</i>	.05	2	.175		

TABLE 58 (continued)

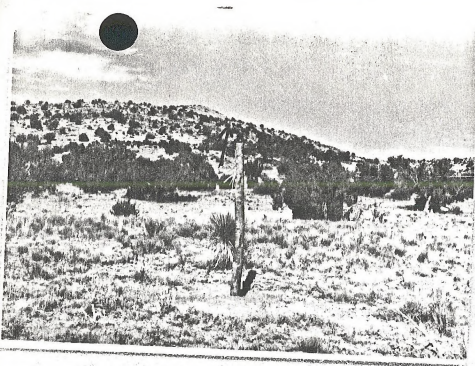
VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #11					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Pochalalca	4.25	16	.900		
Dyssodia papposa	.90	1	.025		
Broomdalia	.05	1	.975		
Sporablis giganteus	.05	1	.025		
Wooly Paperflower	.20	1	.150		
Litter		94	32.380		
Bare ground		85	52.580		

Reptiles

Transect #11. Density estimates were not made for this transect. Enemidophorus neomexicanus, Cnemidophorus tesselatus, Cnemidophorus uniparens and Sceloporus undulatus all occur abundantly here. Other species verified for this habitat type include Bufo woodhousei, Scaphiopus hammondi, Arizona elegans, Lampropeltis setulus, Masticophis flagellum, Pituophis melanoleucus, Thamnophis cyrtopsis, Thamnophis marcianus, Crotalus viridis, and Crotalus atrox.



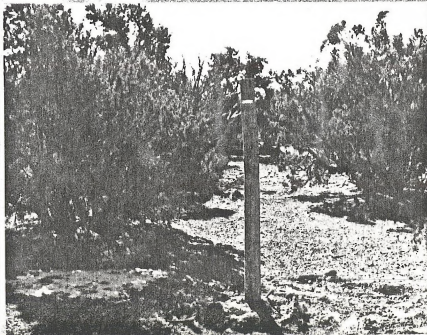


Upper Left Beginning of Transect #8
 Direction of transect in direction
 of arrow.

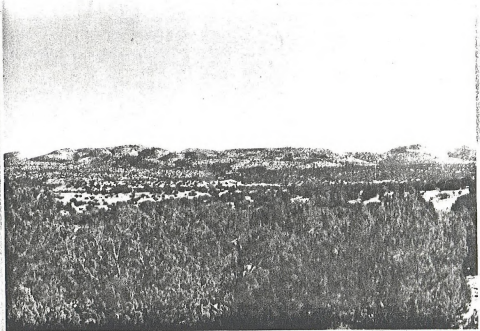
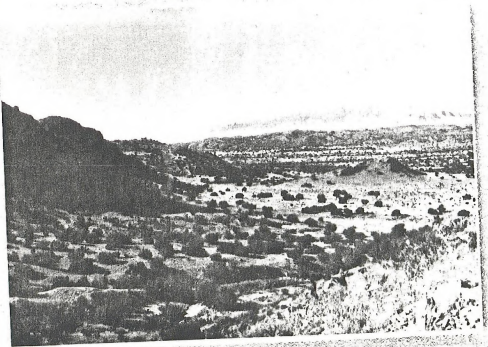


Upper Right Pinyon-Juniper along Transect #9

Lower Right Beginning of Transect #9



Pinyon-Juniper woodland east side of the
Rio Grande River

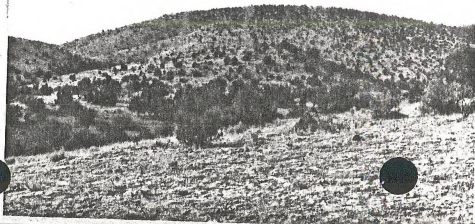
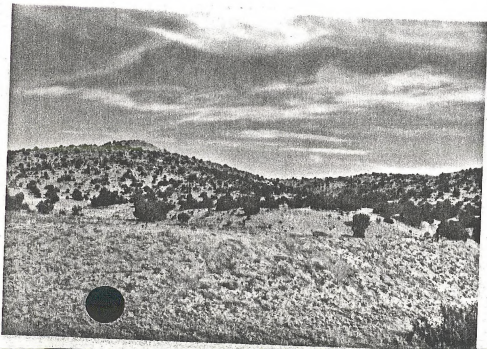
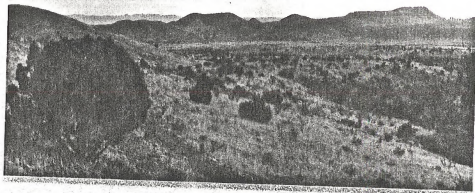


Upper Right &
Lower Left

Typical Pinyon-Juniper woodland
west side of the Rio Grande
River

Lower Right

Pinyon-Juniper woodland
Chupadera Mesa





STANDARD HABITAT SITE #12

Pinyon-Juniper Woodlands

Habitat Sites - Pinyon/Juniper Mesa, 72,295; Pinyon/Juniper Hill, 444,172; Pinyon/Juniper Mountain, 26,982; total acres 543,449.

This large SHS is found throughout the study area in the higher elevations, with the best stands growing on sandy limestone hills, basalt hills, malpais, and loamy range sites. Small scattered stands of one-seeded junipers start being found around 6,000 ft. on north-facing slopes. As the elevation gets higher pinyon becomes more and more dominant until in the higher elevations such as Chupadera Canyon and the east side of the Magdalenas pinyon is the dominant tree with alligator juniper and oaks being the subdominant tree. Diversity in non-game species and plants is high in this SHS.

Bird diversity was the second highest in habitats sampled (Tables 60 and 61). Twenty-six different species were observed with the black-throated sparrow, house finch, ash-throated flycatcher, Bewick's wren, scrub jay, and common bushtit being the dominant birds. Bird species were almost the same along the two bird transects run. Birds found in pinyon juniper are typical of tree, understory edge habitats. Grassland type birds are noticeably absent from the two pinyon-juniper areas sampled. Black-chinned sparrows were common along transect #8 which was on Chupadera Mesa but absent along Transect #9 which was in Bordo Atravesado Hills. This is probably due to lack of Rhus, Mahonia, and gray oak along Transect #9. The black-chinned sparrow appeared to prefer vegetation with a denser canopy that was present on Chupadera Mesa but absent where transect #9 was run. Breeding, probable breeding, and birds observed flying over Transects 8 and 9 are listed in Tables 62 and 63.

Mammal diversity was also better along Transect #8 than Transect #9. This is also directly related to understory vegetation. Peromyscus truei was common on both transects which is a common mouse associated with pinyon-juniper woodland (Tables 64 and 65).

Both transect locations were good deer habitat for the study area. Browse and forbs were available as well as adequate canopy cover. Male and female deer were observed in both locations. The two areas sampled are subjected to hunter pressure during hunting season.

Plant diversity was extremely high on Chupadera Mesa (Transect #8) in comparison to other places sampled (Table 66). Seventy-two plants were verified along the transect. Eighteen grasses, thirty-three forbs, and six browse plants were found. Transect #9 was less diverse with five grasses, three forbs and six shrubs being present (Table 67).

Junipers average about three hundred twenty-five trees per hectare with canopy cover averaging 26 percent. Pinyon trees were considerably less in density and found only at the higher elevations in the study area. On the east side of the Magdalena Mountains, however, pinyon trees are more numerous than junipers above 6,500 feet until the ponderosa pine zone is reached.

TABLE 59

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #8	Date	Species	Summer			Winter		
			Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
	1-3 July 1980	Black-Throated Sparrow	50	.100	500			
	1-3 July 1980	House Finch	48	.117	406			
	1-3 July 1980	Ash-Throated Flycatcher	33	.271	120			
	1-3 July 1980	Bewick's Wren	33	.108	301			
	1-3 July 1980	Scrub Jay	28	.100	275			
	1-3 July 1980 6-8 Jan. 1981	Brown Towhee	20	.200	113	13	.156	80
	1-3 July 1980	Black-Chinned Sparrow	20	.100	200			
	1-3 July 1980	Western Kingbird	15	.125	120			
	3 July 1980	Ladder-Backed Woodpecker	10	.100	100			
	1-3 July 1980	Mockingbird	8	.167	45			
	1-3 July 1980	Rufous-Crowned Sparrow	8	.100	75			
	2-3 July 1980	Mourning Dove	5	.167	30			
	2-3 July 1980	Scott's Oriole	5	.167	30			
	2-3 July 1980	Common Nighthawk	5	.100	25			

TABLE 59 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #8	Date	Species	Summer			Winter		
			Observed Density (Birds)km2	CD	Estimated Density (Birds)km2	Observed Density (Birds)km2	CD	Estimated Density (Birds)km2
	3 July 1980	Rock Wren	3	.167	15			
	3 July 1980	Blackbird Cowbird Spp.	3	.125	20			
	1 July 1980	Sharp-Shinned Hawk	3	.100	25			
	6-8 Jan. 1981	Townsend's Solitaire				8	.250	30
	6-8 Jan. 1981	Say's Phoebe				3	.1	23
	7-8 Jan. 1981	Dark-Eyed Junco				53	.167	314
	7-8 Jan. 1981	Sage Thrasher				5	.1	50
	7-8 Jan. 1981	Plains Titmouse				13	.208	60
	7-8 Jan. 1981	Western Bluebird				8	.167	45
	7-8 Jan. 1981	Crissal Thrasher				3	.167	15
	7 Jan. 1981	Canyon Wren				3	.125	20
	7-8 Jan. 1981	Pinyon Jay				15	.250	60

TABLE 60

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #9		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
24-26 June 1980 27-28 Jan. 1981	Common Bushtit	80	.088	909	200	.167	1,198
24-26 June 1980	Ash-Throated Flycatcher	45	.167	270			
24-26 June 1980	Bewick's Wren	35	.100	350			
24-26 June 1980	Black-Throated Sparrow	33	.120	271			
24-26 June 1980	Mockingbird	25	.143	175			
24-26 June 1980	Rock Wren	23	.167	135			
24-26 June 1980	Plains Titmouse	20	.083	241	3	.250	10
24-25 June 1980	House Finch	15	.150	100			
24-25 June 1980 29 Jan. 1981	Ladder-Backed Woodpecker	10	.125	80	3	.167	15
25-26 June 1980	Hummingbird Spp.	8	.100	75			
25 June 1980 27-28 Jan. 1981	Scrub Jay	8	.167	45	15	.125	120

TABLE 60 (continued)

BIRD DENSITIES AND COEFFICIENT OF DETECTABILITY (CD) FOR EACH SPECIES, DATE, AND
TRANSECT FOR WINTER AND SUMMER

Transect #9		Summer			Winter		
Date	Species	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²	Observed Density (Birds)km ²	CD	Estimated Density (Birds)km ²
26 June 1980	Scott's Oriole	5	.100	50			
24 June 1980	Pinyon Jay	5	.125	40			
24 June 1980	Red-Tailed Hawk	3	.100	25			
27-28 Jan. 1981	Townsend's Solitaire				40	.286	140
27 Jan. 1981	Brown Towhee				3	.125	20
28 Jan. 1981	Common Flicker				8	.250	30
29 Jan. 1981	Bluebird Spp.				3	.167	15
28 Jan. 1981	Dark-Eyed Junco				5	.167	30

TABLE 61
BIRDS OBSERVED FLYING OVER TRANSECT #8

Turkey Vulture	6 observed flying over transect 1 July 1980
Red-Tailed Hawk	1 observed flying over transect 1 July 1980
Mourning Dove	1 observed flying over transect 1 July 1980
House Finch	2 observed flying over transect 3 July 1980
Common Nighthawk	2 observed flying over transect 3 July 1980
Black-Throated Sparrow	B
House Finch	B
Ash-Throated Flycatcher	B
Bewick's Wren	B
Scrub Jay	B
Brown Towhee	B
Black-Chinned Sparrow	B
Western Kingbird	B
Ladder-Backed Woodpecker	B
Mockingbird	PB
Rufous-Crowned Sparrow	PB
Mourning Dove	PB
Scott's Oriole	PB
Common Nighthawk	PB
Rock Wren	PB
Blackbird/Cowbird Spp.	PB
Sharp-Shinned Hawk	PB
Townsend's Solitaire	NB observed winter only

TABLE 61 (continued)
BIRDS OBSERVED FLYING OVER TRANSECT #8

Say's Phoebe	NB
Dark-Eyed Junco	NB
Sage Thrasher	NB observed winter only
Plains Titmouse	NB observed winter only
Western Bluebird	NB observed winter only
Crissal Thrasher	NB observed winter only
Canyon Wren	NB observed winter only
Pinyon Jay	PB

B = Breeding, PB = Possible Breeding, NB = Non-breeding

TABLE 62
BIRDS OBSERVED FLYING OVER TRANSECT #9

Common Raven	1 observed flying over transect 29 January 1980
Turkey Vulture	3 observed flying over transect 24 June 1980
Hummingbird Spp.	1 observed flying over transect 25 June 1980
Common Nighthawk	1 observed flying over transect 26 June 1980
Common Bushtit	B
Ash-Throated Flycatcher	B
Bewick's Wren	B
Black-Throated Sparrow	B
Mockingbird	B
Rock Wren	B
Plains Titmouse	B
House Finch	B
Ladder-Backed Woodpecker	B
Hummingbird Spp.	B
Scrub Jay	PB
Red-Tail Hawk	B
Townsend's Solitaire	NB observed winter only
Brown Towhee	NB observed winter only
Common Flicker	NB observed winter only
Bluebird Spp.	NB observed winter only
Dark-Eyed Junco	NB observed winter only

B = Breeding, PB = Probable Breeding, NB = Non Breeding

TABLE 63

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #8					
Date Trapped	Species	Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
6 Jan. 1981	Peromyscus truei			9	9
6 Jan. 1981	Dipodomys merriami			1	1
8 Jan. 1981	Peromyscus maniculatus			1	1
6-7-8 Jan 1981	Neotoma albigula			3	3
6-7 Jan. 1981	Ammospermophilus			2	2
7-8 Jan. 1981	Reithrodentomys montanus			2	2
29 Oct. 1981	Neotoma albigula	1	1		
31 Oct. 1981	Peromyscus maniculatus	1	1		
31 Oct. 1981	Perognathus flavus	1	1		

* Density = Mammals/360 trap nights

TABLE 64

MAMMAL DENSITIES FOR EACH SPECIES DOCUMENTED ON
TRANSECT LINES BY SNAP TRAPPING

Transect #9		Number Trapped	Summer Trapping Success*	Number Trapped	Winter Trapping Success*
Date Trapped	Species				
3 Sept. 1980	Dipodomys merriami	1			
3 Sept. 1980	Neotoma albigula	1			
4-5 Sept. 1980	Peromyscus truei	3			
28 Jan. 1981	Dipodomys merriami			8	8
27-28 Jan. 1981	Peromyscus truei			5	5

* Density = Mammals/360 trap nights

TABLE 65

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #8					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
<i>Sporobolus contractus</i>	.563	4	.350		
<i>Salsolea kali</i>	1.630	13	.450		
<i>Bouteloua gracilis</i>	2.750	8	1.050		
<i>Muhlenbergia arenicble</i>	.063	1	.025		
<i>Astragadus</i>	.063	2	.050		
<i>Zinnia grandefolia</i>	.188	1	.025		
<i>Tridens pibsus</i>	2.940	17	.925		
<i>Sanbitallia aberti</i>	.75	6	.150		
<i>Talinum calycinum</i>	.125	2	.050		
<i>Aristida fendleriana</i>	.875	7	.650		
<i>Mirabilis diffusa</i>	.875	11	.275		
<i>Sporabilis</i>	.25	1	.025		
<i>Happlopappus spinulosus</i>	.563	6	.275		
Fluffgrass	.188	1	.025		
<i>Tridens spinosus</i>	1.250	2	.300		
<i>Dysscoia acerssa</i>	.063	2	.525		
<i>Euphorbia exstipulata</i>	2	11	.275		
<i>Viguera cordifolia</i>	.0625	1	.025		
<i>Allionia incarnata</i>	.2500	1	.025		
<i>Berbris hagmatocapa</i>	.0625	1	.975		
<i>Aristida spp.</i>	.2500	1	.150		

TABLE 65 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #8					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Indian Paintbrush	.0625	1	.025		
Mirabilis multiflora	.1880	3	1.025		
Evoliulus nuttali	.0625	1	.025		
Nightshade	.0625	1	.025		
Bouteloua hirsuta	1.125	7	.525		
Hilaria jamesii	1.313	3	.450		
Xanthocephalum sarrothrae	.250	4	.225		
Chamaesaracha coronocus	2.188	21	1.125		
Euphorbia serrula	9.313	47	1.780		
Bouteloua eriopoda	8.000	19	3.680		
Sporabilis cryptanous	1.560	8	.450		
Ring muhly	.500	2	.300		
Ipomea castellata	.9375	9	.350		
Cocklebur	.0625	1	.025		
Winterfat	0	1	.025		
Sitanion henseni	.188	2	.050		
Stipa eminens	.188	2	.050		
Unknown Spp.	.0625	1	.025		
Scroph	0	1	.025		
Poerieris	.0625	1	.625		

TABLE 65 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #8					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Aponoea lederacoa	.0625	1	.025		
Mountain Mahogany	2/100m ²		.98	.08	
Muse	.375	4	1.175		
Opuntia spp.	3/100m ²		.42	.01	
Rhus macroflora	7/100m ²		1.67	.11	
Yucca spp.			.56	.02	
Mattonia Spp.			3.57	.51	
Sideoats Grama	1.125/m ²	6	.75		
Dalea brachystachys	1.5/m ²	14	.35		
Lycurus phleoides	.313	3	.075		
Spanish Dagger	4/100m ²	3	2.550	.10	
Parthenium incanum	.25/m ²	5	2.000		
Cholla	.0625/m ²	1	.625		
Muhlenbergia smitiissina	.0625/m ²	1	.025		
Nama hispidum	.125/m ²	3	.025		
Bahia absathfolia	0/m ²	2	.050		
Kallstroemia parviflora	.0625/m ²	1	.025		
Parthenium	0/m ²	1	.025		
Portulaca parvuta	1.75/m ²	7	.300		
Aristida adscensionis	.125/m ²	2	.050		

TABLE 65 (continued)

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect #8					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Dalea formosa	.0625/m ²	2	.525		
Apache-plume	.125/m ²	1	.025		
Chenopodium graveoteus	0/m ²	1	.025		
Dyssodia papposa	0/m ²	1	.025		
Hymenoxys argentea	.0625/m ²	1	.025		
Aristida wrightia	.188/m ²	2	.050		
Muhlenbergia	7.625/m ²	29	4.350		
Artistida spp.	.0625/m ²	1	.025		
Leer caser	.125/m ²	1	.025		
Euphorbia findleri	.375/m ²	2	.300		
Juniperus	150/ha		35.300	4.76	

TABLE 66

VEGETATION DENSITIES, PERCENT FREQUENCY, PERCENT COVER,
GROSS VOLUME AND TREND INDEX FOR EACH PLANT SPECIES
DOCUMENTED ON TRANSECT LINE

Transect # 9					
Specie	Density	% Frequency	% Cover	Gross Volume	Trend Index
Bouteloua eriopoda	2.68/m ²	36	50.300		
Xanthocephalum sarrothrae	3.9/m ²	17	3.300		
Mesa Dropseed	.24/m ²	7	4.070		
Eriogonum abertianum	.03/m ²	2	.080		
Ring muhly	.3/m ²	8	4.890		
Stipa spp.	.15/m ²	6	1.500		
Mirabilis spp.	.03/m ²	2	.180		
Aristida fendleriana	.23/m ²	11	1.950		
Prickly-leafed Dogwood	.01/m ²	1	.030		
Chihuahua Flax	.08/m ²	4	.700		
Thelesperma loneipes	.02/m ²	2	.200		
Dalea formosa	.01/m ²	1	.150		
Rhus macrofloria	3.00/100m ²		.800	.05	
Ephedra spp.	2.0/100m ²		.130	.06	
Mountain Maghony	1.0/100m ²		2.540	.38	
Opuntia spp.	6.0/100m ²				
Agave	9/100m ²		.620	.29	
Mahonia spp.	3/100m ²		.090	2.29	
Jumo	500/ha		16.800	4.64	
Cholla	2/100m ²		.590	.71	

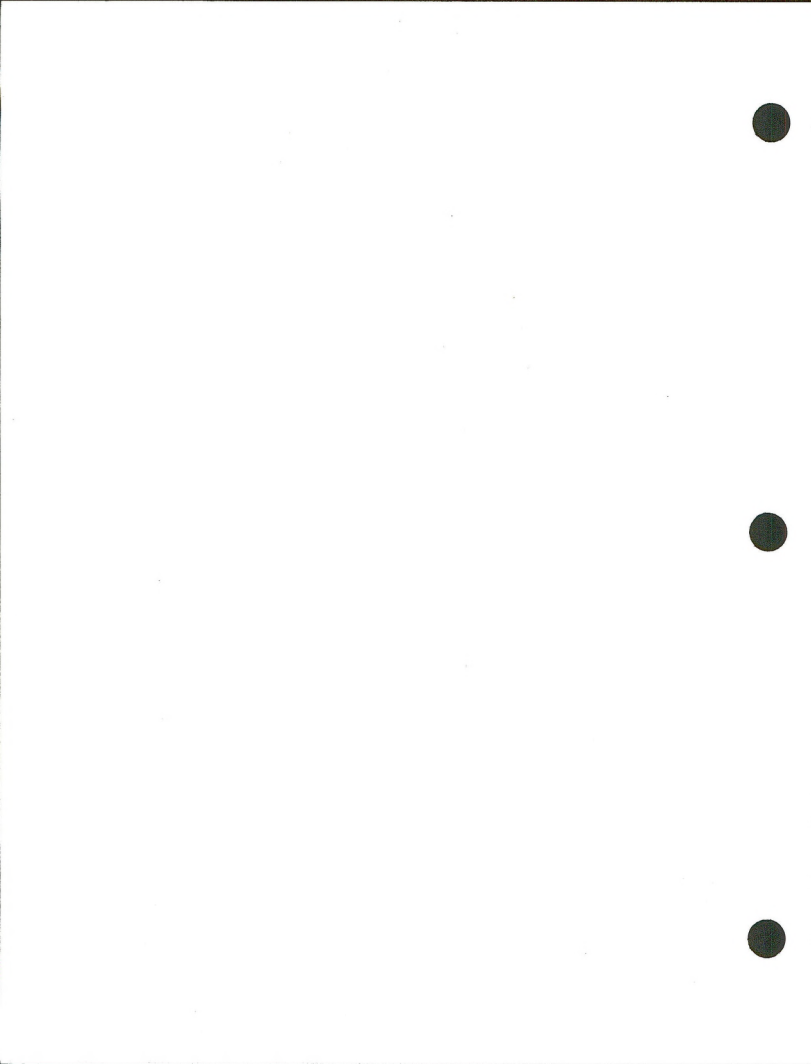
Reptiles

Transect #8. 4 June 1980. Cnemidophorus exsanguis (2.5/ha), Sceloporus undulatus (.625/ha), Unidentified (.625/ha). Crotalus atrox observed, Crotalus viridis collected.

Cnemidophorus exsanguis is in ideal habitat for the species here. It is more common in small arroyos and on rocky hillsides where Cercocarpa and Juniperus grow. Sceloporus undulatus is, again, more common than indicated because it utilizes habitat features from which individuals are not readily seen. An S. undulatus was caught in a mouse snap-trap set at the base of a juniper in October with snow on the ground. A local rancher reported that Crotalus molossus and Crotaphytus collaris occur here as well. The entire area was very dry and there was very little ground cover between junipers along the transect.

Reptiles

Transect #9. 1 July 1980. No density estimates were made for this transect, and only a single Cnemidophorus unipareus was seen the day this transect was done. Drought may have been a contributing factor. Earlier in June Cnemidophorus exanguis, Crotaphytus collaris and Salvadora grahamiae were collected from the transect site. C. collaris is very abundant in this habitat. Gambelia wislizenii was observed along the road to the horse corral, which comes through a long, fairly wide canyon through this habitat type; this species is not typically associated with pinyon-juniper; however, Pituophis aelandeucus was observed.



STANDARD HABITAT SITE #11

Mixed Shrub Hogback

Habitat Sites - Blue grama/Yucca, 6,259; Mountain Mahogany/Yucca, 6,515; total acres 12,774.

This SHS is found in the southwest end of the study area. The area is called the Devil's Backbone and is composed of a narrow ridgeline that is the southend of the Magdalenas. The terrain is quite steep with distinct differences between the east side and the west side of the ridge line. Vegetation on the east side resembles the Sonoran Life Zone and the west side more closely resembles vegetation in the Divide Planning Area, typically blue grama and snakeweed. Due to lack of time no transects were run in this SHS. Animal and plant composition is unknown at the time of report writing. However, bird species observed in the area are recorded and small mammals closely resemble those found in Madera Canyon transect #6 SHS Pseudoriparian.

A small pronghorn herd of twelve were observed along the lower slopes of the hogback.

BIRDS OBSERVED ON APRIL 15, 1980

Mountain Bluebird

Black-Throated Sparrow

Brown Towhee

Golden Eagle

Rock Wren

Scott's Oriole

Horned Lark

Western Meadowlark

Western Kingbird

Crissal Thrasher

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/2	Elevation	Habitat Site	#	Notes	Auth.
Masticophis flagellum	5/19/80	7.4 mi. S. of San Antonio on NM Rt. 2					DOR nc				
Tantilla nigriceps	5/19/80	17.7 mi. S. of San Antonio on NM Rt. 2					collected				
Thamnophis marcianus	5/21/80	3.2 mi. S. of San Antonio on NM Rt. 2					collected				
Crotalus viridis	5/21/80	4.7 mi. S. of San Antonio on NM Rt. 2					NC				
Crotalus viridis	5/21/80	18.4 mi. S. of San Antonio on NM Rt. 2					NC				
Crotalus viridis	5/21/80	15.0 mi. S. of San Antonio on NM Rt. 2					collected				
Crotalus atrox	5/21/80	17.9 mi. S. of San Antonio on NM Rt. 2					collected				
Arizona elegans	5/21/80	13.7 mi. S. of San Antonio on NM Rt. 2					collected				

Road Riding

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
Lampropeltis getulus	5/21/80	2.9 mi. E. of San Antonio on U.S. Hwy. 380					collected				
Pituophis melanoleucus	5/21/80	7.6 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Arizona elegans	6/11/80	18.9 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Arizona elegans	6/11/80	29.2 mi. E. of San Antonio on U.S. Hwy. 380				✓	DOR coll.				
Arizona elegans	6/11/80	20.7 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Crotalus viridis	6/11/80	20.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Crotalus viridis	6/11/80	20.8 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Crotalus viridis	6/11/80	26.8 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				

Road Kiding

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site	#	Notes	Auth.
<i>Crotalus viridis</i>	6/11/80	2.8 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
<i>Hypsiglena torquata</i>	6/11/80	3.9 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
<i>Hypsiglena torquata</i>	6/11/80	3.7 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Rhinocheilus lecontei</i>	6/11/80	25.6 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Scaphiopus bombifrons</i>	6/11/80	23.5 mi. E. of San Antonio on U.S. Hwy. 380					collected			There were anuran choruses at several points along the Hwy.	
<i>Scaphiopus hammondi</i>	6/11/80	1.5 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Lampropeltis getulus</i>	6/17/80	1.4 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Rhinocheilus lecontei</i>	6/17/80	21.5 mi. E. of San Antonio on U.S. Hwy. 380					collected				

Road Riding

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	h	Elevation	Habitat Site	#	Notes	Auth.
<i>Crotalus viridis</i>	6/17/80	38.4 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Lampropeltis getulus</i>	6/18/80	2.9 mi. S. of San Antonio on NM Hwy. 1					NC				
<i>Thamophis marciauu</i>	6/18/80	4.9 mi. S. of San Antonio on NM Hwy. 1					collected				
<i>Crotalus atrox</i>	7/1/80	3.2 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Tantilla nigriceps</i>	7/1/80	13.2 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Tantilla nigriceps</i>	7/1/80	24.9 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Crotalus viridis</i>	7/1/80	15.2 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
<i>Crotalus atrox</i>	7/1/80	6.7 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site	#	Notes	Auth.
<i>Crotalus atrox</i>	7/1/80	3.2 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Pituophis melanoleucus</i>	7/2/80	1.2 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
<i>Rhinocheilus lecontei</i>	7/2/80	17.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
<i>Arizona elegans</i>	7/2/80	23.0 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Scaphiopus hammondi</i>	7/8/80	32.2 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Tantilla nigriceps</i>	7/8/80	14.5 mi. E. of San Antonio on U.S. Hwy. 380					NC				
<i>Scaphiopus couchi</i>	7/8/80	9.7 mi. E. of San Antonio on U.S. Hwy. 380					collected				
<i>Arizona elegans</i>	7/8/80	1.9 mi. E. of San Antonio on U.S. Hwy. 380					NC				

Road Riding

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	¼	Elevation	Habitat Site	#	Notes	Auth.
Rhinocheilus lecontei	7/9/80	25.4 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Pituophis melanoleucus	7/9/80	12.0 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Arizona elegans	7/9/80	10.8 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Crotalus atrox	7/10/80	43.7 mi. E. of San Antonio on U.S. Hwy. 380					NC				
Gyalopion canum	7/10/80	29.2 mi. E. of San Antonio on U.S. Hwy. 380					collected				
Arizona elegans	7/10/80	17.9 mi. E. of San Antonio on U.S. Hwy. 380					NC				
Rhinocheilus lecontei	7/10/80	7.4 mi. E. of San Antonio on U.S. Hwy. 380					NC				
Hypsiglena torquata	7/10/80	3.6 mi. E. of San Antonio on U.S. Hwy. 380					NC				

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{2}$	Elevation	Habitat Site	#	Notes	Auth.
Tantilla nigriceps	7/14/80	16.5 mi. E. of San Antonio on U.S. Hwy. 380					NC				
Rhinocheilus lecontei	7/14/80	12.1 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Lampropeltis getulus	7/14/80	8.1 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Rhinocheilus lecontei	7/14/80	7.6 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Thamnophis marcianus	7/15/80	0.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Crotalus viridis	7/15/80	14.0 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Rhinocheilus lecontei	7/15/80	29.7 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Heterodon nasicus	7/15/80	24.9 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				

Road Riding

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
Arizona elegans	7/15/80	10.0 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Thamnophis marcianus	7/15/80	0.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Arizona elegans	7/16/80	22.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Rhinocheilus lecontei	7/16/80	11.3 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Lampropeltis getulus	7/16/80	23.4 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Lampropeltis triangulum	7/16/80	18.5 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Scaphiopus couchi	8/5/80	27.0 mi. E. of San Antonio on U.S. Hwy. 380					collected				
Tantilla nigriceps	8/5/80	29.6 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
Thamnophis marcianus	8/5/80	1.0 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Scaphiopus couchi	8/6/80	26.0 mi. E. of San Antonio on U.S. Hwy. 380					Lg. chorus				
Tantilla nigriceps	8/6/80	28.3 mi. E. of San Antonio on U.S. Hwy. 380					DOR nc				
Lampropeltis getulus	8/6/80	27.6 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				
Rhinocheilus lecontei	8/6/80	15.2 mi. E. of San Antonio on U.S. Hwy. 380					DOR coll.				

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/2	Elevation	Habitat Site	#	Notes	Auth.
Cnemidophorus inoryatus	5/22/80	Site #1	8S	2E	1 & 6		1300	Yucca Sand Sage		Start time 9:05 a.m. 1%cc, wind SW 20. A juvenile <u>Masticophis flagellus</u> and an adult <u>Terrapene ornata</u> were seen at the end of the transect; the former was collected. Lizards were abundant throughout the length of the transect. All <u>Sceloporus</u> except one were seen on the yucca. Appear to be confined to these, probably as the area became increasingly xeric since the end of the Pleistocene, moved from trees to yucca as former became extinct.	Price
" "	" "	" "	8S	2E	1 & 6		1790	" "			" "
" "	" "	" "	8S	2E	1 & 6		980	" "			" "
" "	" "	" "	8S	2E	1 & 6		940	" "			" "
" "	" "	" "	8S	2E	1 & 6		930	" "			" "
" "	" "	" "	8S	2E	1 & 6		0	" "			" "
" "	" "	" "	8S	2E	1 & 6		4040	" "			" "
" "	" "	" "	8S	2E	1 & 6		4070	" "			" "
" "	" "	" "	8S	2E	1 & 6		0	" "			" "
" "	" "	" "	8S	2E	1 & 6		2820	" "			" "
" "	" "	" "	8S	2E	1 & 6		665	" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{8}$	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus inoryatus	5/22/80	Site #1	8S	2E	1 & 6		790	Yucca Sand Sage			Price
Uta stansburiana	" "	" "	8S	2E	1 & 6		650	" "			" "
" "	" "	" "	8S	2E	1 & 6		1390	" "			" "
" "	" "	" "	8S	2E	1 & 6		2555	" "			" "
" "	" "	" "	8S	2E	1 & 6		3520	" "			" "
" "	" "	" "	8S	2E	1 & 6		1520	" "			" "
" "	" "	" "	8S	2E	1 & 6		430	" "			" "
" "	" "	" "	8S	2E	1 & 6		0	" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site	#	Notes	Auth.
Cnemidophorus exsanguis	6/4/80	Site #8 P-J Oscura	6S	7E	14		1900	Yucca Sand Sage		Start 8:55 a.m. Soil sun 29 degrees Celcius at 8:45 a.m. 5 degrees cc, cumulus all on horizon. Wind calm, very light variable breeze. Talked with Wally Ferguson, rancher here, and he says all three <u>Crotalus</u> (atrox, molossus and viridis) occur here as well as <u>Crotaphytus collaris</u> . Couldn't find end of transect. The first three <u>exsanguis</u> were all together in the vicinity of an ant nest, possibly feeding on it and all three went under the same bush for shelter. Very, very dry and very little ground cover between the junipers along the transect. <u>C. exsanguis</u> associated with small arroyos and rocky juniper hillsides, nowhere else. Absence of <u>Phrynosoma</u> . Surprisingly, lots of (continued)	Price
" "	" "	" "	6S	7E	14		2100	" "			" "
" "	" "	" "	6S	7E	14		2140	" "			" "
" "	" "	" "	6S	7E	14		1720	" "			" "
Sceloporus undulatus	" "	" "	6S	7E	14		3805	" "			" "
Unidentified	" "	" "	6S	7E	14		2120 (in rodent burrow)				" "
		Cnex = 250/km ²		2.5/ha							
		Scun = 62.5/km ²		.625/ha							
		Unid = 62.5/km ²		.625/ha							

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
										(continued) active ant mounds. Saw two other small lizards on flats between ridges - both times they ran under cover before they were identified. My guess Uta, but just a guess. Great Horned Owl in cut.	

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus unipareus	7/1/80	Site #9	2S	3E	28		1220	P-J Hill		5% cc cirrus. Wind SW 5-10. 9:25 a.m.	Price
Cnemidophorus exsanguis	" "	" "	2S	3E	28		-	" "		These latter three species collected and observed on previous visits. <u>C. collaris</u> common.	" "
Salvadora grahamiae	" "	" "	2S	3E	28		-	" "			" "
Crotaphytus collaris	" "	" "	2S	3E	28		-	" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	* Habitat Site	#	Notes	Auth.
Cnemidophorus inornatus	5/29/80	Site #10	4S	3E	5,8,9		2160	Alkali sacaton blackgrama, pediment		Start 9:00 a.m. cc% Wind NNW 20-25. Soil sun 26 degrees Celcius. This is heavily over-grazed rangeland in my opinion. There is really only one species of lizard here. The identity of H. maculata is tentative. Finish 10:15 a.m. Soil sun 44 degrees Celcius at 11:15 a.m.	Price
"	"	"	4S	3E	5,8,9		1845	"	"	"	"
"	"	"	4S	3E	5,8,9		1580	"	"	"	"
"	"	"	4S	3E	5,8,9		5000	"	"	"	"
"	"	"	4S	3E	5,8,9		1440	"	"	"	"
"	"	"	4S	3E	5,8,9		2440	"	"	"	"
"	"	"	4S	3E	5,8,9		1970	"	"	"	"
"	"	"	4S	3E	5,8,9		4070	"	"	"	"
"	"	"	4S	3E	5,8,9		3420	"	"	"	"
"	"	"	4S	3E	5,8,9		1370	"	"	"	"
"	"	"	4S	3E	5,8,9		0	"	"	"	"
"	"	"	4S	3E	5,8,9		2640	"	"	"	"
"	"	"	4S	3E	5,8,9		1810	"	"	"	"
"	"	"	4S	3E	5,8,9		490	"	"	"	"

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus inornatus	7/16/80	Site #10	4S	3E	5,8,9		3150	Alkali sacaton blackgrama, pediment		Start 9:00 a.m. Wind ENE 5-10. cc 30% cumulus. The grass-hopper crop was certainly successful. Lizard activity down from last time.	Price
" "	" "	" "	4S	3E	5,8,9		3310	" "			" "
" "	" "	" "	4S	3E	5,8,9		810	" "			" "
" "	" "	" "	4S	3E	5,8,9		1300	" "			" "
" "	" "	" "	4S	3E	5,8,9		0	" "			" "
" "	" "	" "	4S	3E	5,8,9		1040	" "			" "
" "	" "	" "	4S	3E	5,8,9		1010	" "			" "
" "	" "	" "	4S	3E	5,8,9		4020	" "			" "
Holbrookia maculata	" "	" "	4S	3E	5,8,9		2670	" "			" "
" "	" "	" "	4S	3E	5,8,9		2260	" "			" "
" "	" "	" "	4S	3E	5,8,9		3250	" "			" "
Homa = 62.5 Cnin = 812.5 875.0		Homa = 62.5/km ² Cnin = 817.5/km ² 875 8.75/ha			.625/ha 8.125/ha						
Cnin = 500/km ² Homa = 187.5 687.5	5/ha 1.875/ha 6.875/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

F

Species	Date	Locality	T	R	S	1/2	Elevation	Habitat Site	#	Notes	Auth.
Sceloporus undulatus	6/11/80	Site #11	2S	1W	1 & 12			Bosque tract, cottonwood,		Just did for species occurrence as transect needs to be re-classed. All of these species are common.	Price
Cnemidophorus neomexicana	" "	" "	2S	1W	1 & 12			" "			" "
Cnemidophorus tessellatus	" "	" "	2S	1W	1 & 12			" "			" "
Cnemidophorus uniparens	" "	" "	2S	1W	1 & 12			" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus inornatus	5/30/80	Site #12	3S & 4S	3E	32 & 5		1620	Creosote, snakeweed, cuesta		Start 8:45 a.m. 0% cc, wind calm, slight S breeze, soil sun 24 degrees Celcius.	Price
" "	" "	" "	" "	" "	" "		1700	" "		Wandered a bit from transect, so this is certainly an under- estimate. Much of transect runs along high-angle slopes.	" "
Cnemidophorus tessellatus	" "	" "	" "	" "	" "		2260	" "		C. tessellatus probably confined to low-angle slopes below: other- wise, perfect habitat.	" "
" "	" "	" "	" "	" "	" "		1010	" "		Finish 10:15 a.m.	" "
" "	" "	" "	" "	" "	" "		1230	" "		Soil sun 36.5 degrees Celcius 10:45 a.m.	" "
Crotaphytus collaris	" "	" "	" "	" "	" "		2920	" "			" "
" "	" "	" "	" "	" "	" "		0	" "			" "
" "	" "	" "	" "	" "	" "		5000+	" "			" "
Cnin = $125/\text{km}^2$ 1.25/ha Cnte = $187.5/\text{km}^2$ 1.875/ha Crco = $187.5/\text{km}^2$ 1.875/ha $500/\text{km}^2$ 5/ha											

* - Distance in transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/2	Elevation*	Habitat Site	#	Notes	Auth.
<i>Uta stansburiana</i>	5/21/80	Site #4	4S 5S	1W	3S & 2		2130	Creosote, Snakeweed pediment		Walked 1700 paces = 1417 meters. Could not find flags at starting point, so I picked one and ran a transect. I was undoubtedly close close to the original transect. Start time 8:50; finish 10:00 a.m. Perhaps too early for Citisris, as were beginning to be active in typical fashion towards 10 a.m. <i>U. stansburiana</i> on other hand, probably become inactive about then. Transect runs perpendicular to several large arroyos. <i>H. texana</i> abundant but confined to them and their edges, so density estimates at this site will undoubtedly be inaccurate for this species. <i>M. flagellum</i> was found at end of transect at 10 a.m. Soil surface at 72 degrees Farenheight at 8:10 a.m. 0% cc, wind H 10-15g 20.	Price
" "	" "	" "	" "	" "	" "		2890	" "		" "	" "
" "	" "	" "	" "	" "	" "		0	" "		" "	" "
" "	" "	" "	" "	" "	" "		3540	" "		" "	" "
" "	" "	" "	" "	" "	" "		3610	" "		" "	" "
" "	" "	" "	" "	" "	" "		6220	" "		" "	" "
<i>Cnemidophorus tigris</i>	" "	" "	" "	" "	" "		4040	" "		" "	" "
" "	" "	" "	" "	" "	" "		5790	" "		" "	" "
" "	" "	" "	" "	" "	" "		965	" "		" "	" "
" "	" "	" "	" "	" "	" "		440	" "		" "	" "
<i>Holbrookia texana</i>	" "	" "	" "	" "	" "		2155	" "		" "	" "
<i>Masticophis flagellum</i>	" "	" "	" "	" "	" "		0	" "		" "	" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site #	Notes	Auth.
Cnemidophorus tigris	7/15/80	Site #4	4S 5S	1W	35 & 2		1930	Creosote, Snakeweed pediment	Start 9 a.m. 10% cc high cirrus wind E 0-5. Absence of <u>Uta</u> over last time noticeable. Increase <u>C. tigris</u> not <u>noticeably</u> due to young of year.	Price
"	"	"	"	"	"	"	3010	"		"
"	"	"	"	"	"	"	2280	"		"
"	"	"	"	"	"	"	3530	"		"
"	"	"	"	"	"	"	3660	"		"
"	"	"	"	"	"	"	1225	"		"
"	"	"	"	"	"	"	3900	"		"
"	"	"	"	"	"	"	3900	"		"
"	"	"	"	"	"	"	1690	"		"
"	"	"	"	"	"	"	4205	"		"
"	"	"	"	"	"	"	1525	"		"
"	"	"	"	"	"	"	2330	"		"
"	"	"	"	"	"	"	5000+	"		"
"	"	"	"	"	"	"	5000+	"		"
"	"	"	"	"	"	"	2690	"		"
"	"	"	"	"	"	"	2730	"		"

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus tigris	7/15/80	Site #4	4S 5S	1W	35 & 2		1090	Creosote, Snakeweed pediment			Price
Uta Stansburiana	" "	" "	" "	" "	" "		3050	" "			" "
Unidentified (large possibly <u>S. Magister</u>)	" "	" "	" "	" "	" "		2840	" "			" "
5/21/80											
Utst = 423.4/km ²	4.234/ha										
Cnti = 282.3/km ²	2.823/ha										
Hote = 70.57/km ²	.7057/ha										
776.27/km ²	7.76/ha										
7/15/80											
Utst = 62.5/km ²	.625/ha										
Cnti = 1062.5/km ²	10.625/ha										
UnID = 62.5/km ²	.625/ha										
1187.5/km ²	11.875/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/2	Elevation*	Habitat Site	#	Notes	Auth.
Uta stansburiana	5/21/80	Site #4	4S 5S	1W	3S & 2		2130	Creosote, Snakeweed pediment		Walked 1700 paces = 1417 m. Could not find flag at starting point so picked one and ran transect. I was undoubtedly close to original transect. Start time 8:50, finish 10:00 a.m., perhaps too early for <u>C. tigris</u> , as were beginning to be active in typical fashion towards 10 a.m. <u>U. stansburiana</u> on other hand, probably became inactive about then. Transect runs perpendicular to several large arroyos. <u>H. texana</u> abundant but confined to them and their edges, so density estimates at this site will undoubtedly be inaccurate for this species. <u>M. flagellum</u> was found at end of transect 10 a.m. Soil surface 72 degrees Fahrenheit 8:10 a.m. 0% cc wind H 10-15g 20.	Price
" "	" "	Site #4	""	""	" "		2890	" "			" "
" "	" "	" "	""	""	" "		0	" "			" "
" "	" "	" "	""	""	" "		3540	" "			" "
" "	" "	" "	""	""	" "		3610	" "			" "
" "	" "	" "	""	""	" "		6220	" "			" "
Cnemidophorus tigris	" "	" "	""	""	" "		4040	" "			" "
" "	" "	" "	""	""	" "		5790	" "			" "
" "	" "	" "	""	""	" "		965	" "			" "
" "	" "	" "	""	""	" "		440	" "			" "
Holbrookia texana	" "	" "	""	""	" "		2155	" "			" "
Masticophis flagellum	" "	" "	""	""	" "		0	" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus tigris	7/15/80	Site #4	4S 5S	1W	35 & 2		1930	Creosote, Snakeweed pediment		9 a.m. 10% cc high cirrus wind E 0-5. Absence of <u>Uta</u> over last time noticeable. Increase <u>C. tigris</u> <u>not</u> <u>noticeably</u> due to young.	Price
" "	" "	" "	" "	" "	" "		3010	" "		" "	" "
" "	" "	" "	" "	" "	" "		2280	" "		" "	" "
" "	" "	" "	" "	" "	" "		3530	" "		" "	" "
" "	" "	" "	" "	" "	" "		3660	" "		" "	" "
" "	" "	" "	" "	" "	" "		1225	" "		" "	" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus inornatus	5/23/80	Site #5	9S	2E	5 & 6		2260	Hija/ Snakeweed lava		I'm sure that this is an underestimate; in trying to spot and follow the transect line I probably missed some lizards. <u>C. collaris</u> is very abundant throughout the flow. On the outer fringes where there is a lot of sand and yucca etc. <u>C. inornatus</u> is abundant with <u>S. undulatus</u> confined to the yuccas. As one proceeds towards the interior (rough lava, surface, blocks, etc.) <u>C. inornatus</u> disappears and <u>C. uniparens</u> becomes abundant. Start 9:00 a.m., finish 10:25 a.m. 0% cc, wind 0-5 SSE.	Price
"	"	"	"	"	"	"	2330	"	"	"	"
"	"	"	"	"	"	"	5000+	"	"	"	"
"	"	"	"	"	"	"	1010	"	"	"	"
"	"	"	"	"	"	"	0	"	"	"	"
"	"	"	"	"	"	"	0	"	"	"	"
"	"	"	"	"	"	"	0	"	"	"	"
"	"	"	"	"	"	"	2725	"	"	"	"
"	"	"	"	"	"	"	2910	"	"	"	"
Cnemidophorus uniparens	"	"	"	"	"	"	2410	"	"	"	"
"	"	"	"	"	"	"	540	"	"	"	"
"	"	"	"	"	"	"	1400	"	"	"	"
Uta stansburiana	"	"	"	"	"	"	0	"	"	"	"
Sceloporus undulatus	"	"	"	"	"	"	3430	"	"	"	"

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Crotaphytus collaris	5/23/80	Site #5	9S	2E	5 & 6		2550	Hija/ Snakeweed lava			Price
" "	" "	" "	" "	" "	" "		0	" "			" "
" "	" "	" "	" "	" "	" "		1330	" "			" "
Cnin = 562.5/km2	5.625/ha										
Cnun = 187.5/km2	1.875/ha										
Utst = 62.5/km2	.625/ha										
Scun = 62.5/km2	.625/ha										
Crco = 187.5/km2	1.875/ha										
1062.5/km2	10.625/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Holbrookia texana	6/19/80	Site #6 Madera Canyon	4S	2W	20		2550	Oak-Juniper		Wind 5-10 SW. 80% cc cumulus. Air temp. 75 degrees Celcius 10 a.m. Urosaurus and Sceloporus are much more common than indicated throughout the canyon. Holbrookia was only seen at the mouth of the canyon. All three Cnemidophorus species occur together on the canyon floor. Several small, isolated showers occurred throughout the day.	Price
" "	" "	" "	" "	" "	" "		0	" "			" "
" "	" "	" "	" "	" "	" "		0	" "			" "
Urosaurus ornatus	" "	" "	" "	" "	" "		0	" "			" "
Sceloporus poinsetti	" "	" "	" "	" "	" "		2260	" "			" "
" "	" "	" "	" "	" "	" "		990	" "			" "
" "	" "	" "	" "	" "	" "		3140	" "			" "
Cnemidophorus exsanguis	" "	" "	" "	" "	" "		0	" "			" "
" "	" "	" "	" "	" "	" "		840	" "			" "
Cnemidophorus tessellatus	" "	" "	" "	" "	" "		1140	" "			" "
Cnemidophorus uniparens	" "	" "	" "	" "	" "		790	" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site	#	Notes	Auth.
Cnemidophorus uniparens	6/19/80	Site #6 Madera Canyon	4S	2W	20		1040	Oak-Juniper			Price
Hote = 187.5/km ² Uror = 62.5/km ² Scpo = 187.5/km ² Cnex = 125/km ² Cnte = 62.5/km ² Cnun = 125/km ² <u>750/km²</u>	1.875/ha .625/ha 1.875/ha 1.25/ha .625/ha 1.25/ha <u>7.5/ha</u>										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Phrynosoma moletum	6/19/80	Site #7	4S	2W	21, 27&28			Cholla/ Snakeweed pediment		Wind NNE 10-15 S 25 2:40 p.m. 70% cc cumulus. None on way down, five <u>Cnemid</u> and Pmod on way back, wind 35 W 4:00 p.m. Clouds, rain squalls and sun- shine all at once. Lizards affected.	Price
Cnemidophorus uniparens	" "	" "	" "	" "	" "			" "			" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site #	Notes	Auth.
Cnemidophorus inornatus	6/5/80	Site #14	6S	8E	34		2185	Oscura-Cholla	Start 9 a.m. Wind 0-5 NE. cc 15% cirrus. Soil sun 24.5 degrees Celcius. Last marker found was tied to a fence, couldn't find end marker. Wind 20-30 S. at end. Red-tailed hawk nesting along (near) transect.	Price
"	"	"	"	"	"	"	810	"	"	"
"	"	"	"	"	"	"	2160	"	"	"
"	"	"	"	"	"	"	3390	"	"	"
"	"	"	"	"	"	"	550	"	"	"
"	"	"	"	"	"	"	1780	"	"	"
"	"	"	"	"	"	"	3480	"	"	"
"	"	"	"	"	"	"	2230	"	"	"
"	"	"	"	"	"	"	2230	"	"	"
Uta stansburiana	"	"	"	"	"	"	1625	"	"	"
"	"	"	"	"	"	"	1675	"	"	"
"	"	"	"	"	"	"	2960	"	"	"
Sceloporus undulatus	"	"	"	"	"	"	790	"	"	"
Unidentified	"	"	"	"	"	"	2520	(looking for water; ran under juniper)	"	"

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{2}$	Elevation*	Habitat Site	#	Notes	Auth.
Phrynosoma douglassi	(added to	species list	July	11,	1980)						Price
Cnin = 562.5/km ²	5.625/ha										
Utst = 187.5/km ²	1.875/ha										
Scun = 62.5/km ²	.625/ha										
UnID = 62.5/km ²	.625/ha										
875/km ²	8.75/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site	#	Notes	Auth.
Sceloporus undulatus	7/30/80	Bingham #15	5S	5E	7		1800	Wolfberry		9 a.m. wind WSW 5-10 0% cc. Conservative, many more probably present. Large bushes, trees, etc. <u>Terrapene</u> <u>ornata</u> , <u>Cnemidophorus</u> <u>inornatus</u> , <u>Sceloporus</u> <u>magister</u> and <u>Pituophis</u> <u>melanoleucus</u> also present.	Price
" "	" "	" "	" "	" "	" "		1310	" "			" "
Sceloporus hatchling	" "	" "	" "	" "	" "		2110	" "			" "
" "	" "	" "	" "	" "	" "		1110	" "			" "
" "	" "	" "	" "	" "	" "		1790	" "			" "
" "	" "	" "	" "	" "	" "		800	" "			" "
6 X 62.5 = 375/km ²	3.75/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	* Habitat Site #	Notes	Auth.
Uta stansburiana	5/22/80	Site #1	8S	2E	1 & 6		430	Yucca, Sandsage pediment		Price
" "	" "	" "	" "	" "	" "		2220	" "		" "
" "	" "	" "	" "	" "	" "		1435	" "		" "
Sceloporus undulatus	" "	" "	" "	" "	" "		0	" "		" "
" "	" "	" "	" "	" "	" "		0	" "		" "
" "	" "	" "	" "	" "	" "		0	" "		" "
" "	" "	" "	" "	" "	" "		0	" "		" "
" "	" "	" "	" "	" "	" "		1220	" "		" "
" "	" "	" "	" "	" "	" "		1080	" "		" "
" "	" "	" "	" "	" "	" "		640	" "		" "
Holbrookia maculata	" "	" "	" "	" "	" "		780	" "		" "
" "	" "	" "	" "	" "	" "		1090	" "		" "
Crotaphytus wislizeni	" "	" "	" "	" "	" "		1040	" "		" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site #	Notes	Auth.
Cnemidophorus inornatus	7/22/80	Site #1	8S	2E	1 & 6		865	Yucca Sandsage pediment	10% cc cirrus. Wind NE 0-5 gusts 10. 9:35 a.m. Lost transect early on, but feel walked about the required distance.	Price
" "	" "	" "	""	""	" "		560	" "		" "
Uta stansburiana	" "	" "	""	""	" "		1550	" "		" "
" "	" "	" "	""	""	" "		1510	" "		" "
" "	" "	" "	""	""	" "		1370	" "		" "
Cnin = 750/km2 Utst = 625/km2 Scun = 437.5/km2 Homa = 125/km2 Crwi = 62.5/km2 2000/km2	7.5/ha 6.25/ha 4.375/ha 1.25/ha .625/ha 20/ha									
Maf1 - V Teor - Ob Amti - H Scbo - H Scco - H Scha - H Buco - H Bude - H Phco - HV Phmo - H Euob - H										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation*	Habitat Site #	Notes	Auth.
Uta stansburiana	7/22/80	Site #1	8S	2E	1 & 6		880	Yucca, Sandsage pediment	Grasshopper crop very good.	Price
Sceloporus undulatus	" "	" "	" "	" "	" "		1140*	" "		" "
" "	" "	" "	" "	" "	" "		1660 ^o	" "		" "
" "	" "	" "	" "	" "	" "		1390 ^o	" "		" "
Holbrookia maculata	" "	" "	" "	" "	" "		0*	" "		" "
* - collected o - on yucca										
Cnin = 125/km2 1 25/ha Utst = 250/km2 2 5/ha Scun = 187.5/km2 1 875/ha Homa = 62.5/km2 6 25/ha 625/km2 6 25/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation*	Habitat Site #	Notes	Auth.
Urosaurus ornatus	6/18/80	Site #2	3S	1E	28&29		4210	Desert Willow, Brickella, ISR	Wind 5-10 S, 50% cc cumulus. Soil surface temp. 31 degrees Celcius at 9 a.m. Major part of arroyo surface hardpan no lizards (i.e. Holbrookia because too hard, very sparse cover, etc.). All those seen associated with desert willow hammocks or areas of creosote on borders of arroyo (lizards moving across arroyo). Upper end of arroyo considerable sand/gravel, and vegetation. Five lizards seen here. Urosaurus seen on rock at beginning of transect.	Price
Crotaphytus wislizeni	" "	" "	" "	" "	" "		1200	" "	" "	" "
Cnemidophorus tessellatus	" "	" "	" "	" "	" "		1950	" "	" "	" "
Cnemidophorus tigris	" "	" "	" "	" "	" "		5000+	" "	" "	" "
" "	" "	" "	" "	" "	" "		4690	" "	" "	" "
" "	" "	" "	" "	" "	" "		0	" "	" "	" "
" "	" "	" "	" "	" "	" "		1760	" "	" "	" "
" "	" "	" "	" "	" "	" "		4070	" "	" "	" "
" "	" "	" "	" "	" "	" "		1690	" "	" "	" "
Unidentified	" "	" "	" "	" "	" "		5000+	" "	" "	" "
Uror = 62.5/km2	.625/ha									
Crwi = 62.5/km2	.625/ha									
Cnte = 62.5/km2	.625/ha									
Cnti = 375/km2	3.75/ha									
UnID = 62.5/km2	.625/ha									
	625/km2									

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	* Habitat Site	#	Notes	Auth.
Cnemidophorus tigris	5/28/80	Site #3	4S	1E 2E	19&24		1460	Broomdala, Mesquite hills		Start 9:15 a.m., end 10:45 a.m. 0% cc, wind SW 0-5 at start, 20 S at end. Soil temp. 29 degrees celcius start, 41 degrees Celcius at finish in sun. C. tigris associated with mesquite dunes. Forage out of them, but run to them to seek shelter. There are a lot of grasshoppers on most of the vegetation.	Price
" "	" "	" "	" "	" "	" "		910	" "		" "	" "
" "	" "	" "	" "	" "	" "		4090	" "		" "	" "
" "	" "	" "	" "	" "	" "		2240	" "		" "	" "
Cnemidophorus inornatus	" "	" "	" "	" "	" "		1090	" "		" "	" "
Cnemidophorus neomexicanus	" "	" "	" "	" "	" "		1505	" "		" "	" "
Uta Stansburiana	" "	" "	" "	" "	" "		2190	" "		" "	" "
" "	" "	" "	" "	" "	" "		5000	" "		" "	" "
" "	" "	" "	" "	" "	" "		2180	" "		" "	" "
" "	" "	" "	" "	" "	" "		2020	" "		" "	" "
Phrynosoma modestum	" "	" "	" "	" "	" "		1580	" "		" "	" "

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{2}$	Elevation*	Habitat Site	#	Notes	Auth.
Crotaphytus wislizeni	5/28/80	Site #3	4S	1E 2E	19&24		1240	Broomdala, Mesquite hills			Price
Cnti = 250/km2	2.5/ha										
Cnin = 62.5/km2	.625/ha										
Cnne = 62.5/km2	.625/ha										
Utst = 250/km2	2.5/ha										
Phmo = 62.5/km2	.625/ha										
Gawi = 62.5/km2	.625/ha										
750/km2	7.5/ha										

* - Distance from transect, mm.

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

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Species	Date	Locality	T	R	S	%	Elevation	Habitat Site	#	Notes	Auth.
Great Horned Owls	7/16/80	Wolfberry Snakeweed 1 to 2 mi. W. of Bingham									
Cltff Swallows	7/23/80	Along Highway 380 under overpass						Wolfberry/ Yucca pediment		Two juvenile seen on the ground under a juniper.	
	7/23/80	Many of the concrete passes along 380 has swallow colonies						Under overpass			
Antelope	7/23/80									Wolfberry transect, one male	
Porcupine	7/10/80	41.3 mi. E. of San Antonio on 380						Pinyon-Juniper		Mounted as a specimen	Price
Gray Fox	7/1/80	41 mi. E. of San Antonio on 380								Dead on the road	Price
Burrowing Owl	7/29/80	Jornada Lava Flow						Malpais		Seen inside lava flow, S. Harriet ranch	
Lark Bunting	7/29/80	Yucca Sand sage Fite Ranch						Yucca Sand sage		Lots of birds seen near first windmill	
Red Faced Warbler	8/5/80	Kelllog Canyon						Ponderosa		Watched for a long time; no mistaking that bird	
Yellow-headed Blackbird	9/3/80	San Antonio						Farm land		Birds seen around corral fence just outside of San Antonio	

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site	#	Notes	Auth.
Black Hawk	9/8/80	North of E.B. Marsh						Riparian area		Bird reported to me by Price; seen off dry-land lake road	Price
Bobwhite Quail	9/4/80	2 mi. W. of San Antonio						Creosote		Birds flushed in an arroyo along transect line	Connor
Coopers Hawk	9/15/80	Ojo Del Coyote						Creosote		Bird seen in mesquite along ridgeline near spring	" "
Raptor Eyrie	9/18/80	Arroyo del Tajo						ISR		Cliff face near Tinajai Box	" "
Prairie Falcon	9/18/80	Jornada Plains						Galleta		Sitting on telephone pole along 380	" "
Antelope Ground-squirrel	9/19/80	Found in stock tank	2S	3E	17	SW	6000 ft.	Pinyon-Juniper w/Boer Grass		Found drowned in stock tank	" "
Osprey	9/25/80 to 10/23/80	Chapperal Drive near my house						Farm land, housing development		The bird is hunting along irrigation ditches next to Chapperal Drive	" "
Scaled Owl	10/23/80	10 mi. N of						Soap Tree Yucca		Along road towards first transect seven miles south of windmill	" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Skunk	Porcupine
Date	11/3/80	10/31/80
Locality	Lemitar	
T	3S	
R	6E	
S	5	
% Elevation		
Habitat	Bosque	Pinyon-Juniper
Habitat Site #		
Notes	Small was very distinct along transect line	Seen by John Gilmore in pinyon tree near well
Auth.		

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	4	Elevation	Habitat Site	#	Notes	Auth.
Swainson's Hawk	6/12/80	1½ mi. S. of Fite Well						Sandsage/ Snakeweed		Nest was in mesquite just off the road	Connor
Antelope	6/12/80	3 mi. S. of Fite Well						Sandsage/ Snakeweed		Female crossing the road	" "
Yellow-throated Warbler	6/18/80	Lemitar Transect						Canals, sedges salix		Common along heavily vegetated canals	" "
Indigo Bunting	6/17/80	Lemitar Transect						Canals, sedges salix		One male seen along canal	" "
Yellow-breasted Chat	6/17/80	Lemitar Transect						Canals, sedges salix		Males heard in thick brush along canals	" "
Phainopepla	6/17/80	Near Escondida bridge, S. of dwellings						Saltbush/ Mesquite		Seen in four-wing saltbush along the road	" "
Antelope	6/12/80	Antelope Well North Well, Hackberry Well						Malpais		Mostly male but some female seen at each tank	" "
Deer	6/29/80	On ridge 1 mi. W. of Wild Horse Corral						Pinyon-Juniper		Two does and one fawn was seen along transect line	" "
Raccoon	6/29/80	Alamosa Canyon						Riparian perennial spring			" "
Pinyon Jays	7/1/80	Near Nolda Ranch						Pinyon-Juniper		Flock 20 in pinyon-juniper on Chupadera Mesa near county line	" "

Species	Cooper's Hawk	Deer
Date	7/1/80	7/1/80
Locality	Conveyance Channel 3 mi. N. of San Antonio	Pinyon-Juniper transsect Chupadera Mesa
T		
R		
S		
%		
Elevation		
Habitat	Bosque	Pinyon-Juniper
Habitat Site #		
Notes	Along canal 3 mi. N. of San Antonio	Doe looked like she was ready to drop a fawn; fat and slow
Auth.	Connor	" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site	#	Notes	Auth.
Golden Eagle	5/29/80	1 3/4 mi. W. of Bustos Well	2S	2E	25	SW	6300	Pinyon-Juniper Cliff		Active nest on cliff facing northwest	Connor
Scotts Oriole	5/29/80	2 mi. West	2S	2E	25	SW	6300	Pinyon-Juniper Woodland hills		Male singing from juniper perch	" "
Large Eyrie possible		3 mi. NW; Stallion Peak								Check topo and ground check eyrie	" "
Mule Deer	5/29/80		2S	2E	24	NW		Pinyon-Juniper hills		Appeared to be a doe	" "
Red Tail Hawk Nest	5/29/80		2S	2E	23	NE	5750	Cottonwood Oak Spring		Nest in cottonwood tree next to spring	" "
Western Tanger	5/30/80							Cottonwood Spring		Spring in Arroyo Del Coyote	" "
Yellowrump Warbler	5/30/80							Cottonwood Spring		Spring in Arroyo Del Coyote	" "
House Finch	5/30/80							Cottonwood Spring		Spring in Arroyo Del Coyote	" "
Scaled Quail	6/5/80	Interstate just S. of Mt. Bell towers site								Crossing the interstate	" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	%	Elevation	Habitat	Site #	Notes	Auth.
Red tailed Hawk	6/5/80	Near Torreon #1, Browse transect						Cliff with oak, juniper, and Ponderosa		Nest is active; both adults seen. One was were seen	Connor
Spriny Creevice Lizard	6/10/80	Madera Canyon Transect						Oak, juniper		Seen on rock face	"
Cliff Chipmunk	6/10/80	Madera Canyon Transect						Oak, juniper		Quite a few were seen and heard in the canyon	"
Rock Squirrel	6/10/80	Madera Canyon Transect						Oak, juniper		Quite a few were seen and heard in the canyon	"
Prairie Falcon	6/10/80	Canyon about $\frac{1}{2}$ mi. from Torreon						Cliff face in canyon wall		One adult was seen, eyrie is located above old stick nest	"
Red Tail Hawk	6/10/80	Torreón Spring						Poplar tree Torreón Spring		Three juvenile about ready to fledge the nest	"
Golden Eagle	6/10/80	Nogal (Middle) Canyon						Open grass- land cliff		One adult and one juvenile was seen at the nest	"
Prairie Falcon	6/10/80	Nogal (Middle) Canyon						Cliff		Eyrie looks like it has been used for years	"
Bat Cave	6/10/80	Nogal (Middle) Canyon						Cliff		Where eyrie is located at	"

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{2}$	Elevation	Habitat Site	#	Notes	Auth.
Antelope	6/11/80	3 mi. from Torreon Spring near junction to Nogal Canyon								One male was seen. Two hours later, two more males seen with the first male	Connor

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	1/4	Elevation	Habitat Site #	Notes	Auth.
Cassin's Kingbird	4/23/80	Site #1 20 mi. SE of San Antonio						Yucca Sandsage pediment	Abundant along dirt road	Lewis
Loggerhead Shrike	4/23/80	20 mi. SE of San Antonio						Yucca Sandsage pediment	Abundant along dirt road	Lewis
Swainson's Hawk	4/16/80 to 4/23/80	20 mi. SE of San Antonio						Yucca Sandsage pediment	Three hawks in one area	Lewis
Mourning Dove	4/23/80	15 mi. SE of San Antonio						Yucca Sandsage pediment	Abundant near stock tank and along road	Lewis
Western Box Turtle (female)	4/23/80	15 mi. SE of San Antonio						Yucca Sandsage pediment	Brought specimen in for identification released later	Lewis
Black-tailed Jackrabbit	5/7/80	20 mi. SE of San Antonio						Yucca Sandsage pediment	Fairly common	Lewis
Coyote Scat	5/7/80	20 mi. SE of San Antonio						Mupo inside lava flow <u>Saka</u>	A lot of coyote trapping	Lewis
Desert Cottontail	5/7/80	20 mi. SE of San Antonio						Mulenbergia porteri; lava flow <u>Saka</u>		Lewis

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	%	Elevation	Habitat Site	#	Notes	Auth.
Round-tailed Horned Toad	5/12/80	Site #10									Connor
Whiptail	5/14/80	Site #10						Creosote/Black Grama Questa		Active nest in cliff face facing west; both adults present	"
Golden Eagle	5/15/80							Gallista/Snake-weed pediment		Three females seen	"
Antelope	5/15/80	7 mi. from Transect #10 towards 380						Creosote/Black Grama Questa		Sign was seen along the transect	"
Antelope	5/15/80	Transect #12						Gallista/Snake-weed pediment		Just off the road	"
Scaled Quail	5/15/80	1 mi. N. of 380 on road to Bustos Well									"
Lark Sparrow	5/28/80	North site with Broomdala						Broomdala/Mesquite pediment		Birds had nesting material in their beaks	"
Golden Eagle	5/28/80	4 to 5 mi. S. of Las Canas Spring						Creosote/Snakeweed pediment		Possible active nest on farthest point in Loma de Las Canas	"
Raven Stick Nest (active)	5/28/80							Arroyo, Apache-plume, Mesquite		Nest in side of cliff just off road	"
			3S	2E	19	SE		5300			

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
Red Tailed Hawk Nest	5/28/80	3 mi. S. of de Las Canas Spring						Sandstone Cliffs		Nest about 30 feet up cliff	Connor
Townsend's Warbler Nests	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows		The bird had a cheek patch surrounded by yellow. Yellow-throat wingbars white under tail; one was female, and very common	" "
Mourning Dove	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows		Lots of them	" "
Killdeer	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows		Two of them	" "
Western Kingbird	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows			" "
Cassin's Kingbird	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows			" "
House Finch	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows		Commonly seen in tamarisk	" "
Yellow-rumped Warbler	5/28/80	Ojo de Las Canas						Stream with tamarisk and willows			" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	q	Elevation	Habitat Site	#	Notes	Auth.
Rufous-crowned Sparrow	5/28/80	Ojo De Las Canas						Stream with tamarisk and willows		One was seen next to stream	Connor
Scott's Oriole	5/28/80	Ojo del Rancho de Lopez	2S	2E	30	NE	5200	Mesquite/Cresote		Seen perched in mesquite " "	"
House Finch	5/28/80	Ojo del Rancho de Lopez						Mesquite/Cresote		Seen perched in mesquite " "	"
Mourning Dove	5/28/80	Ojo del Rancho de Lopez						Mesquite/Cresote		Seen perched in mesquite " "	"

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	$\frac{1}{4}$	Elevation	Habitat Site	#	Notes	Auth.
Mockingbird	4/29/80	Bosquecito locality	4S	1E	9			Mesquite/ Four-wing		Birds just arrived and are common in this type of habitat	Connor
Turkey Vulture	4/29/80	Bosquecito locality	4S	1E	9			Mesquite/ Four-wing		Bird appeared to be feeding but upon searching the area, nothing was found	Connor
Western Kingbird	4/29/80	Bosquecito locality	4S	1E	9			Mesquite/ Four-wing			" "
Northern Oriole	4/29/80	Luis Lopez						Cottonwood		Singing in tree around the houses	" "
Roadrunner	4/30/80	San Antonio						Irrigated field			" "
#1	4/30/80	Bosquecito	4S	1E	9			Mesquite/ Four-wing			" "
Rufous-sided Towhee	4/30/80	Bosquecito	4S	1E	9			Cottonwood, Mesquite, Tamarisk, and Four-wing			" "
Roadrunner	4/30/80	Bosquecito	4S	1E	9						
Barn Swallow	4/30/80	Bosquecito	4S	1E	9			Telephone Line			" "
Coachwhip Snake	4/30/80	Bosquecito	4S	1E	21					Crossing road in a chained area near last arch	" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	%	Elevation	Habitat Site #	Notes	Auth.
Gambel's Quail	5/1/80	Bosquecito locality						Last house and trailer next to Arroyo de Las Canas chained area of Tamarisk	The birds were at a stock tank in a recently chained area of Tamarisk	Connor
Gambel's Quail	5/1/80	Bosquecito locality						Last house and trailer next to Arroyo de Las Canas chained area of Tamarisk	The bird was south of the house and trailer crossing the road in a thick tamarisk stand	"
Scaled Quail	4/10/80	Jornada Lava Flow						Ephedra/Snake-weed Malpais	Covey of quail along the transect line	"
Scaled Quail	5/12/80	Questa near big rock carrion						Creosote/Black Grama	Below cliff face	"
Scaled Quail	5/13/80	Alkali Sacaton pediment						Alkali Sacaton pediment	Near junction to alkali Sacaton 2 miles West	"
Mockingbird	5/13/80	Alkali Sacaton pediment						Alkali Sacaton pediment	Near junction to alkali Sacaton 2 miles West	"
Cowbird	5/13/80	Alkali Sacaton pediment						Alkali Sacaton pediment	Near junction to alkali Sacaton 2 miles West	"
Collard Lizard	5/12/80	Creosote Questa Transect						Creosote/Black Grama	Creosote/Black Grama Transect	"
Antelope Ground Squirrel	5/12/80	Questa near big rock carrion						Creosote/Black Grama		"

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	4	Elevation	Habitat Site	#	Notes	Auth.
Antelope	10/31/80		3S	6E	7 & 8			Pinyon-Juniper		Seen by John Gilmore; eight to nine antelope	Gilmore
Antelope	10/24/80	4 mi. W. of Harriet Well T. 8S., R. 1E., Sec. 16	8S	1E				Lava Flow		Seventy-five were seen at North Well in the grant	" "
Merlin	11/5/80	Near petroglyphs in Arroyo del Tajo								Jerry Hinkle saw it coming out of the arroyo	Hinkle
Scaled Quail	11/5/80	Wolfberry Transect						Wolfberry/Juniper		Saw quail near beginning of transect	Connor
Great Blue Heron	11/12/80	Conveyance Channel						Riparian		Found along conveyance channel	" "
Skunk	12/26/80	La Joya Refuge						Riparian		Found dead on interstate next to refuge	" "
Porcupine	12/29/80	Carthage						Creosote, Juniper, Mesquite		Dead on 380 next to Carthage	" "
Weasel	12/10/80	La Joya Refuge						Riparian		Found dead on interstate	" "
Canyon Wren	1/3/81	Madera Canyon						Pseudoriparian		Seen feeding in canyon on gray oaks	" "
Yellow-bellied Sapsucker	1/3/81	Madera Canyon						Pseudoriparian		Seen feeding in canyon on gray oaks	" "

FIELD FORM - VERTEBRATE SPECIES DISTRIBUTION RECORD

Species	Date	Locality	T	R	S	%	Elevation	Habitat Site #	Notes	Auth.
Starling	1/3/81	Stock tank 3 mi. N. Madera Canyon turnout						Stock water tanks	Seen in juniper around tank	
Robin	1/3/81	Stock tank 3 mi. N. Madera Canyon turnout						Stock water tanks	Seen in juniper around tank	
Mtn. Bluebirds	1/3/81	Stock tank 3 mi. N. Madera canyon turnout						Stock water tanks	Seen in juniper around tank	
Antelope	1/7/81	Cholla pediment Madera Canyon						Shrub pediment	Four male, seven female	
Deer	1/7/81	Madera Canyon						Pseudoriparian	Four female	

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats						Unique Habitats			
		Creosote	Lava	Sagebrush Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones					Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
										Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian								
MAMMALS																					
Desert Shrew		□	□	○	□	□								■	□		□	□			
Little Brown										■	■	■	■								
Myotis																					
Fringed Myotis		□				□			□	■	■	■	■	□							●
California Myotis		□	■	□	□	■			□	■	■	■	■	□					●		●
Long-legged Myotis							□				■	■	■								○
Long-eared Myotis								□		■	■	■	■								●
Southwestern								□		■	■	■	■	□							●
Myotis																					
Yuma Myotis										■	■	■	■								●
Small-footed							□			■	■	■	■						○		●
Myotis																					

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats							Unique Habitats	
		Creosote	Lava	Sagebrush	Sagebrush	Sagebrush	Sagebrush	Sagebrush	Sagebrush	Sagebrush	Sagebrush	Riparian Zones								
Silver-haired Bat		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Western Pipistrelle		■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Big Brown Bat												■	■	■	■					■
Red Bat												■	■	■	■		■			
Hoary Bat												■	■	■	■	■				
Spotted Bat												■	■	■	■				■	■
Allen's Big-eared Bat												■	■	■	■	■				■
Townsend's Big-eared Bat		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■
Pallid Bat		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■

Reproduction: ■ Primary (≥40%); ● Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, per colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Cresote	Lava	Sand Sage Yucca	Nesquite	Grasslands	Other Shrubs	Pinyon-Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs, Rimrock	Islands	Caves		
Brazilian Free-tailed Bat		□	□	■	□	■	■	□	■	■	■	■	■	■	□				○		■		
Sylvilagus sp.		□	■	□	□	■	□	■	■	■	■	■	■	■	■		○	■		○			
Black-tailed Jack Rabbit		□	■	■	■	■	□	□	□	□	□	□	□	□	□			■					
Cliff Chipmunk								□		□	■	■	■	■		○	○	■					
Colorado Chipmunk								□		■	■	■	■	■		○	○	■		○			
Gray-collared Chipmunk								□		■	■	■	■	■		○	○	■		■			
White-tailed Antelope Squirrel						■		■										■					
Texas Antelope Squirrel						■		■										■					

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual; pair colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats							Unique Habitats	
		Creosote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Thirteen-lined Ground Squirrel				●	●	●	●	□						□			●			
Spotted Ground Squirrel				●	●	●	●	□						□			●			
Rock Squirrel			□					□	●			●	□					●	●	
Gunnison's Prairie Dog	1 acre - 600 acres or more	□				●	●										●			
Abert's Squirrel								□							○	○				
Red Squirrel								□							○	○				
Botta's Pocket Gopher		□		●		●														
Desert Pocket Gopher		□																		

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Crenate	Lava	Sandage Yucca	Hosquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creeks, Streams	Reservoirs, Pond	Pseudospartan	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves		
Plains Pocket				●		●												●					
Gopher																							
Silky Pocket	Sometimes densities are as high as 23.9 per acre	●	●	○		○		○							●			●					
Mouse																							
Plains Pocket		○	○	●	●	●								●				●					
Mouse																							
Rock Pocket			○	●		●														●			
Mouse																							
Ord's Kangaroo Rat		○	○	○	○	○	○	○	●					○				○					
Banner-tailed		○		○	○	●												●					
Kangaroo Rat																							
Merriam's Kangaroo		●	○	○	○	○	○	○	○					○				○					
Rat																							
Beaver									●		●	●					○	○					

Reproduction: ● Primary (<40%); ○ Secondary (<40%) Feeding: ■ Primary (<40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes feeding habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Crestote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs/Rock	Talus	Caves		
Plains Harvest						■																	
Mouse																							
Western Harvest		■	■	■	■	■	■	■					■	■				■					
Mouse																							
Cactus Mouse			○	○	■														■				
Deer Mouse								○	■				■						■				
White-footed			○		■				■				■						■				
Mouse																							
Brush Mouse								○	○				■						■				
Pinon Mouse								■	■				■						■				
Rock Mouse			■					■	■				■								■		
Northern Grass-		○		○		■																	
hopper Mouse																							

Reproduction: ■ Primary (≥40%); ● Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)									Special Habitats										Unique Habitats	
		Croton	Lava	Sagebrush	Tucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudotripartite	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs, Rimrock	Talus	Caves
Southern Grass-hopper Mouse		■	□	■	□	■	■	■	■						■				■			
Hispid Cotton Rat		□					■											○				
Southern Plains Woodrat		□						■							■				■			
White-throated Woodrat		□	■		□	■	■	■		■				■	□			■	■	■	■	■
Mexican Woodrat			□						□									■	■			
Gapper's Red-backed Mouse																			■			
Mexican Vole									□										■			
Prairie Vole																			■			
Muskrat									■		■	■	■	■								

Reproduction: • Primary (>40%); • Secondary (<40%) Feeding: • Primary (>40%); • Secondary (<40%)

Species	Minimum Habitat required per Individual, per Colony, or Habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats	
		Cresote	Lava	Sand Sage Yucca	Hesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudopartian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
House Mouse																				
Western Jumping Mouse																				
Mouse																				
Porcupine																				
Coyote																				
Kit Fox																				
Gray Fox																				
Black Bear																				
Ringtail																				
Raccoon																				
Long-tailed Weasel																				

Reproduction: • Primary (240%); ◐ Secondary (40%) Feeding: • Primary (240%); ◐ Secondary (40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes per-habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats							Unique Habitats			
		Creosote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus
BIRDS																			
Eared Grebe											●								
Pie-Billed Grebe								□			■	●							
White Pelican								□			□								
Double-Crested Cormorant								□			■	●							
Olivaceous Cormorant								□			■	●							
Great Blue Heron								■			○	■							
Snowy Egret								□			■	●							
Black-crowned Night Heron								□			■	●							
Canada Goose								□			■	●							

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)						Special Habitats										Unique Habitats			
		Cresote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Spring	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
White-fronted Goose																					
Blue Goose																					
Snow Goose																					
Mallard																					
Gadwall																					
Pintail																					
Green-Winged Teal																					
Blue-Winged Teal																					
Cinnamon Teal																					
American Wigeon																					

Reproduction: • Primary (≥40%); • Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats											
		Creosote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinon Juniper	River, Conveyance Channel	Riparian Zones			Pseudoriparian				Edges (Ecotones)			Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves					
										Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Reservoirs, Pond	Edges (Ecotones)															
Northern Shoveler									□			■																		
Red Head									□			■																		
Ring-necked Duck									□			■																		
Canvasback									□			■																		
Lesser Scaup									□			■																		
Common Goldeneye									□			■																		
Ruddy Duck												●																		
Common Merganser									■			■																		
Turkey Vulture		□	□	□	□	□	□	■	■				■													●				
Sharpshinned Hawk	1.0 - 3.0 miles square			□				●	●			●	■	□	○															
Cooper's Hawk	1.0 - 3.0 miles square			□				●	■			●	■	□	○															

Reproduction: ● Primary (≥40%); ● Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Croscote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Climbs Rimrock	Talus	Caves		
Red-tailed Hawk	1.5 - 3.5 miles square	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Swainson's Hawk	1.5 - 2.0 miles square	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Rough-legged Hawk	.24 - 19.2 miles square				□	□	□												□				
Ferruginous Hawk	1.0 - 3.0 miles square				□	□	□												□				
Golden Eagle	8.0 - 10.0 miles square	□	□	□	□	□	□	□	□	□	□	□	□	□	□				□	□	□	□	□
Marsh Hawk	1.5 - 2.0 miles square					□	□			□	□		□										
Osprey	3.0 - 8.0 miles square									□	□	□	□										
Prairie Falcon	2.0 - 5.0 miles square	□	□	□	□	□	□	□	□			□	□						□			□	□
Peregrine Falcon	3.0 - 10.0 miles square							□	□	□	□	□	□	□	□							□	□
Merlin	1.0 - 2.0 miles square				□										□								
American Kestrel	.2 - .6 miles square	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

Reproduction: ■ Primary (≥40%); □ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats		
		Cresote	Lava	Sagebrush Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	Riparian Zones						Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
									River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian								
Harris Hawk	1.5 - 3.5 miles square								□	□	□	■	□		●						
Black Hawk	.5 - 2.0 miles square								■		□	■									
Bald Eagle	2.0 - 6.0 miles square					□			■	□	■	■	□								
Scaled Quail		●	●	□	□	□	□	□	□	□	□	□	□	□	□						
Gambel's Quail									■	■	□	□	■		□						
Turkey								□	■												
Sandhill Crane													□								
Virginia Rail										■	■										
Common Gallinule									□			■	■								
American Coot									□	□	□	■	■								
Killdeer						□			□	■	■	■	■	□							

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats		
		Cresote	Lava	Sand Sage Yucca	Mesquite	Grasslands	Other Shrubs	Playon Juniper	Riparian Zones										Cliffs Rimrock	Talus	Caves
Common Snipe									□		□	□									
Long-billed Curlew					■	●			■	□	□	□									
Mountain Plover			□		■	●							■	●							
Spotted Sandpiper									●	□	□	●	●								
Greater Yellowlegs									□				□								
Long-billed									■				■								
Dowitcher																					
American Avocet									■				■								
Black-Necked Stilt									■				■								
Herring Gull									■				■								
Ring-Billed Gull									■				●								

Reproduction: ● Primary (≥40%); ● Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, per colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)						Special Habitats						Unique Habitats						
		Crosette	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Phylon Juniper	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Forster's Tern									■			■					□			
Least Tern									□			□								
Black Tern									□			□								
Band-Tailed Pigeon								○												
Mourning Dove		□	□	□	□	○	□	□	□	○	□	□	□	□	□					
Yellow-Billed									■		□	■	□							
Cuckoo											□									
Roadrunner		□	□	□	□	○	□	□	■		□		□							
Barn Owl	.3 - 1.0 miles square								■		□	□	□		○		■	●		
Screech Owl					□			■	■		■	□		○						
Flammulated Owl								○							□					

Reproduction: ■ Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats		
		Creosote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones				Edges (Ecotones)		Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Great Horned Owl	1.5 - 2.0 miles square	□	□	□	■	□	□	■	■	■	□	□	■	■	□	■			■		
Burrowing Owl	.16 - .62 miles square		□			■									□			■			
Poorwill		□	□	■			□								□						
Common Nighthawk		■	□	□	□			■	□	□	■	□	■	■							
Lesser Nighthawk		□	□	□	□		□		■	□	□	□	□	■							
White-Throated															□			■	□		
Swift																					
Black-Chinned								□	□												
Hummingbird																					
Broad-Tailed								■	□			□	■								
Hummingbird																					
Rufous Hummingbird								□							□						

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats							Unique Habitats
		Crescote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Playon Juniper	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	
Belted Kingfisher									■	□	■	■	■						
Common Flicker								□	■	□	□	■	□		■	□			
Yellow-Bellied								□											
Sapsucker																			
Williamson's								□							■				
Sapsucker																			
Hairy Woodpecker								□	■	□	□	■			■	■			
Ladder-Backed				□	□			■	■				■		■	■			
woodpecker																			
Eastern Kingbird								□											
Western Kingbird			□	■	■	□	□	■	■	□	□	□	■	■		□			
Cassin's Kingbird						□		■						□					

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats		
		Creosote	Lava	Sand Sage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones				Special Habitats						Climbs Rimrock	Talus	Caves		
Ash-Throated		□	□	□	□		□	□	□	□	□	□	□	□	□	□	□	□						
Flycatcher																								
Black Phoebe									□	□	□	□	□	□	□	□	□							
Say's Phoebe		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□							
Willow Flycatcher									□	□	□	□	□	□	□	□	□							
Dusky Flycatcher								□						□	□									
Western Flycatcher								□																
Olive-Sided								□								□								
Flycatcher																								
Horned Lark			□	□	□	□	□								□				□					
Violet-Green		□		□	□	□		□	□		□	□	□	□	□	□	□							
Swallow																								

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)						Special Habitats						Unique Habitats						
		Creosote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Tree Swallow	☐							☐	☐	☐	☐	☐	☐	☐						
Bank Swallow									☐	☐	☐	☐	☐					☐		
Rough-winged Swallow								☐	☐	☐	☐	☐	☐	☐				☐		
Barn Swallow					☐			☐			☐	☐	☐	☐				☐		
Cliff Swallow					☐													☐		☐
Purple Martin								☐				☐	☐	☐	☐					
Stellar's Jay								☐				☐	☐	☐						
Scrub Jay			☐	☐		☐	☐							☐						
Pinon Jay							☐					☐	☐	☐						
Common Raven		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐		

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats	
		Cresote	Lava	Sandsage Yucca	Hesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones										Climbs Rimrock
White-necked Raven				●	●	□	□		□		□	□	□	●	●			●		
Mountain Chickadee								○	□					○	●	□				
Plain Titmouse								●	●					●	●	●				
Bushtit				□	□			●	■					■	□					
Verdin			○	●			○													
White-Breasted								●						○	■					
Nuthatch														○	□					
Red-Breasted								○	□					○	□	●				
Nuthatch																				
Brown Creeper								○	□					○	□	■	■			
House Wren								○	□		○		○	□	■					
Winter Wren								○					○	□						

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Include any, or habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats				
		Cresote	Lava	Sand Sage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones			Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Bewick's Wren		□		□				●								■	□	●	■				
Canon Wren								□	○							■	●				■	●	
Rock Wren												□				■	●				■	●	○
Cactus Wren				●	●	●	●	●									□						
Mockingbird			□	●	●	●		□	□							■	□	○					
Crissal Thrasher		□		□	●			□	□							■	□						
Sage Thrasher				●		□										○	□	□					
Curve-billed Thrasher				□												□	○						
American Robin				□				●								■	●	□					
Hermit Thrush		□	□																				

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats							Unique Habitats	
		Creosote	Lava	Sand Sage Yucca	Hesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones			Edges (Ecotones)			Climax Rimrock	
Western Bluebird								○					○	●			
Mountain Bluebird								○					○	●			
Townsend's Solitaire								○					○	○			
Golden-Crowned Kinglet								○									
Ruby-Crowned Kinglet									■			■	■				
Black-Tailed Gnatcatcher													○	■			
Cedar Wax-wing								■				■					
Phainopepla								●				○					
Loggerhead Shrike		○	○	○	○	○	○	○	○	○		○	○	○			

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Creosote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Climbs Rimrock	Talus	Caves		
Starling						□			■						□	●							
Bell's Vireo					■				■		■	■	■	□	■								
Solitary Vireo									■		■	■	■										
Gray Vireo								■	■														
Yellow-warbler									■	■	□	■	■										
Macgillivray's								□	■		■	■	□										
Warbler																							
Common Yellow									■		■	■	■										
throat																							
Yellow-Breasted									■	□	■	■	■										
Chat																							
American Redstart												■	■										

Reproduction: ■ Primary (≥40%); ● Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Cresote	Lava	Sagebrush	Yucca	Mesquite	Grasslands	Other Shrubs	Playon Juniper	River, Conveyance Channel	Natural Springs	Riparian Zones	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Climbs	Kimrock	Talus	Caves
House Sparrow								□	□	□					□	□	□						•
Western Meadowlark			□	□	□	□	□	□								□							
Yellow-Headed										□				□		□							
Blackbird																							
Red-Winged										•	•	•	•	•	•	•	•						
Blackbird																							
Boat-Winged										□						□							
Grackle																							
Northern Oriole										•	□	□	□	•	□	•							
Rusty Blackbird										□				□									
Brewer's Blackbird							□			•				•									
Common Grackle										□				•		•							

Reproduction: • Primary (>40%); ◐ Secondary (<40%) Feeding: ■ Primary (>40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats										Unique Habitats		
		Crosete	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Cliffs Rimrock	Talus	Caves
Brown-Headed						□			■		□	□	□	□	□						
Cowbird																					
Eastern Meadowlark					□																
Western Tanager								□	■		■	□	□	□							
Hepatic Tanager								□													
Summer Tanager									■		■	■		□							
Rose-Breasted									□		■	□									
Grosbeak																					
Black-Headed								□	■				■	□							
Grosbeak																					
Blue Grosbeak									■												
Evening Grosbeak							□														

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes, or habitat for feeding.	Plant Comm. Grps. (Habitats)						Special Habitats										Unique Habitats		
		Cressote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones								Cliffs Rimrock	Talus	Caves
Cassin's Finch								□												
House Finch		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□				
Pine Siskin								□												
American Goldfinch						□														
Lesser Goldfinch									□				□	□	□					
Green-Tailed								□						□						
Towhee																				
Rufous-Sided								□					□	□	□					
Towhee																				
Lark Bunting			□	□	□	□														
Pyrrhuloxia		□						□												

Reproduction: • Primary (>40%); ◊ Secondary (<40%) Feeding: ■ Primary (>40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or population. Includes habitat for feeding.	Plant Comm. Grps. (Habitats)							Special Habitats							Unique Habitats					
		Cresote	Lava	Sandage Yucca	Mesquite	Grasslands	Other Shrubs	Pinon Juniper	Riparian Zones	River, Conveyance Channel	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Climbs Rimrock	Talus	Caves
Lawrence's									●					□	□						
Goldfinch																					
Savannah Sparrow						□															
Vesper Sparrow						□															
Lark Sparrow			●			□		□													
Black-Throated		●	●	□	□	□	□	□	□	□	□	□	□	□	□	□					
Sparrow																					
Sage Sparrow		●	●	□	□	□	□	□					□	□	□						
Dark-Eyed Junco								□	□				□	□							
Gray-Headed								□						□							
Junco																					
Chipping Sparrow			□			□								□	□						

Reproduction: ● Primary (≥40%); ○ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

Species	Minimum habitat required per individual, pair, colony, or habitat for feeding.	Plant Comm. Grps. (Habitats)										Special Habitats										Unique Habitats	
		Cresote	Lava	Sandsage Yucca	Mesquite	Grasslands	Other Shrubs	Pinyon Juniper	River, Conveyance Channel	Riparian Zones	Natural Springs	Creek, Streams	Reservoirs, Pond	Pseudoriparian	Edges (Ecotones)	Snags	Logs	Burrows	Citrif's Rimrock	Talus	Caves		
Brewer's Sparrow		□		■										□	□								
White-crowned Sparrow															■								
Black-Chinned Sparrow								■						□	□								
White-Throated Sparrow															□								
Swamp Sparrow									□				□										
Song Sparrow									□				□										
Rufous-Crowned Sparrow							□																
Cassin's Sparrow				■			□																

Reproduction: • Primary (≥40%); ◦ Secondary (<40%) Feeding: ■ Primary (≥40%); □ Secondary (<40%)

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